LEVEL II

12

Research Product 81-5

XM1 GUNNERY TRAINING AND APTITUDE REQUIREMENTS ANALYSES

ARI FIELD UNIT AT FORT KNOX, KENTUCKY

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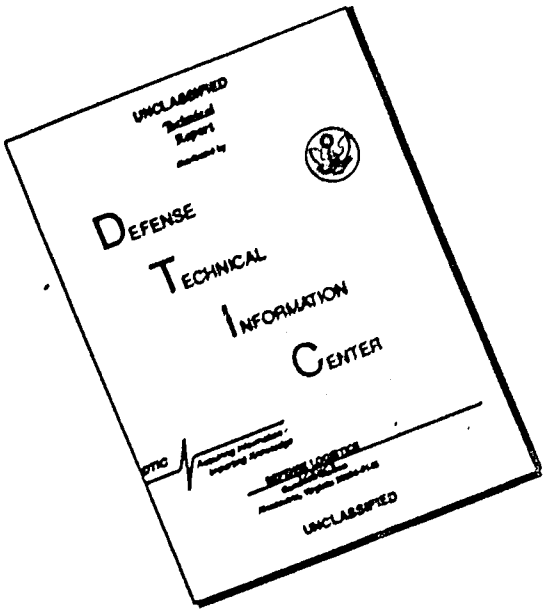

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This research compared, by crew position and by task, the gunnery training and aptitude requirements of the XM1 and the M60A1 tank systems. Task inventories were prepared for each crew position in the XM1 as well as for tasks which required interaction among crewmembers. A comparability analysis identified XM1 tasks posing potential training or aptitude problems and proposed tentative solutions. In addition, the location where specific XM1 tasks would be trained was identified, e.g., in OSUT or in operational units. Findings from the XM1

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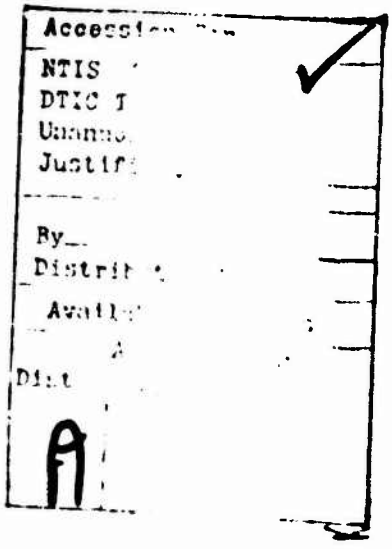
M60A1 comparability analyses include: 1) the majority of XM1 tasks which are directly analogous to M60A1 tasks are easier to perform on a fully operational XM1 tank while performance of these same tasks on a non-fully operational XM1 is almost identical in difficulty to M60A1 tasks; 2) tasks which are unique to the XM1 are often difficult on a fully operational XM1 and almost always very difficult on a non-fully operational XM1; and 3) automation in XM1 equipment design has made operator task performance during normal target engagements easier, but has conversely increased the scope and complexity of preoperational tasks under normal and degraded conditions.



Research Product 81-5

XM1 GUNNERY TRAINING AND APTITUDE REQUIREMENTS ANALYSES

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Education and Training

FOREWORD

An area of major importance in the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is individual soldier proficiency. Soldier proficiency is, at least in part, a function of both the soldier's aptitudes and the effectiveness of the training he receives. The ARI Field Unit at Fort Knox, in its Work Unit "Assigning Trainees to Armor Crew Duty Positions (XM-1)," is concerned with determining the job aptitudes that can be utilized to provide a basis for crewman assignment to attain optimal job performance in the M-1 tank. In a related work unit, "Armor Training for XM-1 Gunnery and Combat Missions", the field unit is developing methods necessary for effectively training the M-1 tank crewman, with particular emphasis on the unique characteristics of the M-1 tank and the effects of varying aptitudes among recruits entering the Armor training system. Basic to these efforts is the derivation of unique M-1 operating requirements as they relate to the aptitudes and skill requirements of crewmember job performance.

This research product provides comparability analyses, using the M60A1 tank system as a standard, which identify probable M-1 crewmember gunnery skill and aptitude requirements. Also identified are tasks which may pose potential assignment or training problems.

This research effort is responsive to the requirements of RDT&E project 2Q763743A794 of the FY 81 ARI Work Program.

JOSEPH ZEIDNER
Technical Director

XM1 GUNNERY TRAINING AND APTITUDES REQUIREMENTS ANALYSES

BRIEF

Requirement:

Previously conducted XM1 task analyses failed to address areas of special concern to Armor crewmen, training developers and recruiters alike. Questions concerning differences in the tank gunnery performance requirements of the XM1 versus the current M60A1 tank and how these differences might affect training or personnel selection remained unanswered. To address these concerns, an analysis of XM1 gunnery training and aptitude requirements was initiated.

Procedure:

Task inventories were prepared for each XM1 crew position and for tasks requiring interaction among crewmembers. A comparability analysis was conducted using the M60A1 as a standard to identify tasks posing potential training or aptitude problems. For each such task, tentative training or assignment solutions were proposed. Also identified were the sites at which training would take place for each of the tasks listed, e.g., OSUT or operational unit.

Findings:

The majority of XM1 tasks which are directly analogous to M60A1 tasks are easier to perform on a fully operational XM1 tank. Performance of these same tasks on a non-fully operational XM1 is almost identical in difficulty to M60A1 tasks. Tasks which are unique to the XM1 are often difficult on a fully operational XM1 and almost always very difficult on a non-fully operational XM1. Automation in XM1 equipment design has made operator task performance during normal target engagements easier, but has conversely increased the scope and complexity of preoperational tasks under normal and degraded conditions.

Utilization of Findings:

These analyses provide the basis for the development of XM1 tank commander and gunner job sample predictors. They have been used in the initial stages of decision-making concerning a review and revalidation of the ASVAB prerequisites for Armor OSUT training. The training comparability portions of these analyses are the major reference for training effectiveness evaluators in their observation of XM1 OSUT classes at the U.S. Army Armor School at Fort Knox.

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TABLES

INTRODUCTION

The advent of the new XM1 main battle tank with its vastly improved fire control system, power plant, suspension system, and armor protection has significantly increased the potential fighting capability of US Armor units. However, the achievement of maximum capability is in large measure a function of the performance of the assigned crewmen. The level of crewman job performance is therefore of primary concern to various members of the Armor community. Future operators, for example, want to know how the XM1 differs from their present tanks. Persons responsible for the design and development of XM1 training want to know what major changes, if any, need to be made in training content or methods of training delivery. Finally, personnel involved in manning the force want to know if new recruits need to be selected on the basis of certain special abilities or aptitudes. In response to these concerns, the US Army Research Institute at Fort Knox has reviewed previous efforts to address these questions and has conducted an evaluation of the training and aptitude requirements for the gunnery portion of the XM1 tank weapons system.

Army materiel systems such as the XM1 tank are initiated, developed, deployed, supported, modified and disposed in an event-step process called the Life Cycle Systems Management Model (LCSMM).[1] As part of the LCSMM, materiel developers are required to provide the Army with a Quantitative and Qualitative Personnel Requirements Information (QQPRI) statement. This statement contains sufficient information for personnel and training planning, and is normally supported by a Front End Analysis (FEA) of the proposed system. As for the XM1, the FEA was to contain at a minimum a listing of the individual duties

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[1] DA Pamphlet 11-25, Life Cycle System Management Model for Army Systems. HQDA: May 1975.

and tasks to be performed in each of the crew positions, the procedures involved in carrying out each task, and a listing of the skills, knowledges, and physical/mental ability requirements.

Chrysler Corporation, the materiel developer for the XM1, delivered to the Army a Task and Skill Analysis (TASA) to satisfy the FEA requirement.[2] Users of the TASA at the Armor School were uniformly critical of the work. Generally described as inaccurate, incomplete and to a large extent, obsolete the TASA failed to provide the information necessary for addressing the concerns of future operators, training developers, or manpower recruiters. The TASA did not inventory the performance requirements which constitute each individual tank crewman's job, i.e., most of the job tasks listed were equipment-oriented rather than behavior-oriented. Moreover, the task analysis was restricted to a mere listing of the steps or procedures required in task performance. The specific knowledges, skills, and physical/mental abilities involved in carrying out each task were noticeably absent.

The Directorate of Training Development (DTD) at the US Army Armor School was required to conduct an XM1 training analysis for the purpose of training entry-level XM1 Armor Crewmen. Using the Chrysler TASA as a resource document, together with Subject Matter Experts (SMEs) transition trained during Operation Testing (OT II) at Fort Hood, DTD performed a training analysis following the Instructional System Design (ISD) model.[3] The result of this effort

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[2] XM1 Tank Program FSED/PEP Phase Task and Skill Analysis Report (Preliminary) for the XM1 Tank; Combat, Full-Tracked 105mm Gun. Report X-COON-1. Sterling Defense Division: Sterling Heights, MI. 30 Sep 77.

[3] US Army Armor Center. Training Development Handbook, Phase 1: Analysis of Instructional Systems Development Procedures, Fort Knox, KY: April 1978.

was an Armor Center task list[4] that provided the basis for the development of Armor training activities to support the XM1.

The training analysis provided by DTD was a marked improvement over the training analysis provided by Chrysler in that it identified the knowledges and skill requirements for task performance. However, the degree of specification remained much too general to meet the particular needs of the intended users. Task analysis documentation on target engagements with the main gun failed to delineate the individual crewmember behaviors which make up the task. For example, the DTD list did not distinguish between the behaviors involved in round sensing during daylight and round sensing at night. Round sensing by the gunner from a moving tank at night using the TIS was not addressed.

Review of the training analyses conducted by Chrysler and DTD left many questions unanswered concerning specific tank gunnery related crewmember behaviors and emphasized the immediate need for a job-task analysis by crew position that would provide the level of detail necessary for comparing gunnery performance requirements across M60A1 and XM1 weapon systems. In response to this need, XM1 gunnery specific tasks lists were prepared for all crew positions, both individually and collectively, XM1 task performance requirements were compared to analogous requirements of the current main battle tank, the M60A1, in terms of their potential for training or assignment problems, tentative solutions were proposed for the potential problems identified and where appropriate, the site selected for training the individual tasks was specified.

To assure a comprehensive approach, information to conduct the present analyses was gathered from numerous sources. The Chrysler and DTD analyses

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[4]Memorandum. ATZK-TD-ID, Subject: MOS 19 E10-40 Tasks Selected for Training, 19 May 1980.

were useful to the extent that they provided an overview of the gunnery job requirements and supportive task analysis documentation. In addition, information was obtained during structured interviews with personnel having varying amounts of experience and varying levels of skill on the XM1. These personnel included Chrysler trained Armor soldiers who served as XM1 crewmen during the second Operational Test (OT-II) of the vehicle, DTD trained Armor soldiers who were to serve as trainers at the third Operational Test (OT-III), and military personnel from an operational TO&E Cavalry unit who participated in the continuous 24 hour day RAM (Reliability, Availability, and Maintainability) testing held at Fort Knox. Many of these interviews were conducted by having the soldier demonstrate the various tasks on the XM1. This allowed ARI researchers the opportunity to observe hands-on task performance of experienced XM1 trained soldiers. Information obtained from each of these sources was checked against the up-to-date version of the XM1 operators manual.[5]

After all appropriate information had been obtained, an orderly process of categorizing the data was followed. Each crew position was analyzed separately, with all crew interactive material combined regardless of whether it involved two-man, three-man, or full crew tasks. A compilation of tasks that make up an individual's job requirements was then prepared for each crew position. This compilation, referred to as a task inventory, contained primarily those duties, tasks, or subtasks designated as gunnery related. Included in the task inventory were the pre/post preventive maintenance checks and services (PMCS).

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[5] US Army. Operator's Manual for Tank, Combat, Full Tracked, 105mm Gun, XM1 (2350-01-061-2445), Draft Technical Manual (TM 9-2350-255-10), August 1980.

The order in which the various tasks appear in the task inventory was based on a chronological sequence of events that occurs in an operational Armor unit preparing for and conducting combat missions. Tasks which were functionally related were grouped together and listed in a duty category classification. (Note: Duties are listed as major classifications and set off by designated Roman numerals.) Tasks which required the performance of one or more individual behaviors and contained a definite beginning and end were listed in a subtask category. (Note: Tasks are denoted by Arabic numerals with subtasks being assigned lower case letters.)

After completion of the task inventories for each crew position and crew interactive, a subjective M60A1 comparability analysis was conducted and potential sources of training problems were identified. Problem identification was based upon knowledge of M60A1 training problems and interviews with new XM1 crewmen concerning training difficulties. To address the concern of personnel responsible for manning the force, the aptitude requirements of each position were addressed by categorizing tasks as primarily involving psychomotor aptitudes or cognitive (mental) aptitudes. Potential assignment problems were noted where the psychomotor aptitude requirements appeared to be unique and/or cognitive aptitude requirements appeared to be higher than those for the M60A1 system.

The results of these analyses are presented in Tables 1 through 5, for tank commander (TC), gunner (GNR), loader (LDR), driver (DVR), and crew interactive, respectively. To facilitate the use of these tables a brief explanation of the table headings and information coding system is presented in the following paragraphs.

Tables 1 through 4 contain the task inventories and analyses for each crew position (Table 5 will be discussed separately). Each table contains three major headings or information divisions, titled M60A1 Task Comparison Analyses, Tentative Solutions and Training Sites, respectively. The first heading or division (see example below) contains a task by task classification

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS							
	COMMON-ALITY	TASK PERFORM		PROBLEM		CAUSE		JOB SAMPLE
		EASIER	HARDER	TRAIN	ASSIGN	MOTOR	MENTAL	
VI. PERFORM TIS CHECKOUT	UNIQUE	NO	YES	YES	YES	YES	YES	POS
33. Prepare TIS for Operation	U			X			X	

which in the first column, COMMONALITY, notes whether performance of the list XM1 task was unique ("UNIQUE" or "U") to the XM1, different ("DFRNT" or "D") in some aspect from the M60A1, or essentially the same ("SAME" or "S") as its M60A1 counterpart.

Also found in the initial division is a task by task subjective evaluation of the performance difficulty of XM1 tasks with reference to the M60A1. For example, a "YES" appearing under the heading labeled, TASK PERFORM: HARDER, denotes that the duty area in general appears to be more difficult to perform on the XM1 than in the M60A1. A subsequent "X" or "(x)" in that column indicates that a specific task or subtask within that duty area appears more difficult. Subtasks classified as less difficult to perform are noted in a similar manner under the heading labeled, TASK PERFORM: EASIER.

The next analysis within this division classifies tasks as having or not having the potential for causing training or assignment problems. A duty or task identified as a potential training problem was defined as one which may require substantially more training time or training resources than its M60A1 counterpart. Such duties were noted by placing "YES" under the heading

labeled, PROBLEM: TRAIN, while tasks or subtasks with potential training problems were noted by "X" or "(x)", respectively. Where the data base was insufficient to make a judgment, a question mark (?) was placed in that column. Tasks having potential assignment problems were those which involved a level of difficulty which make it unlikely that personnel minimally meeting present ability requirements (e.g., CO score of 85) could perform effectively. If a potential assignment problem was foreseen based on the requirements in a particular duty, "POS" was placed in the column labeled, PROBLEM: ASSIGN, across from that duty to note the "possible" existence of an assignment problem. Where confidence existed that no assignment problems would be encountered "NO" was entered in the column. Again, tasks and subtasks sharing the same rating as their duty were labeled with "X" and "(x)" respectively. Question marks (?) appear where the data was insufficient to make a judgment.

To complete the M60A1 comparison, duties, tasks and subtasks identified as having potential training and/or assignment problems were classified as to whether the problem was estimated to be the result of particularly unique psychomotor requirements ("MOTOR") or cognitive aptitude requirements ("MENTAL") or both. Duties having potential problems were identified by placing "YES" under the appropriate column heading, CAUSE: MOTOR/MENTAL. Tasks and subtasks receiving the same rating as their associated duty were denoted by "X" or "(x)", respectively.

Duties which appeared to have the potential of being selected for inclusion in a job sample test battery were noted by placing "YES" under the heading, JOB SAMPLE. Those duties which may, after further research, be useful as job samples were noted by placing "POS" in that column, while possible job sample tasks were identified by a question mark (?). A "NO" under the job

sample heading indicates those tasks for which a job sample test was considered inappropriate.

The second heading or division (see example below) contains tentative

XM1 TASK LIST (GUNNER)	TENTATIVE SOLUTION		TRAINING		
	SELECT	TRAIN	MORE HO	JOB AID	TNG DEV
VI. PERFORM TIS CHECKOUT	POS	YES	YES	NO	NO
33. Prepare TIS for Operation		X	X		

solutions for assignment or training problems identified in the M60A1 task comparison analysis.

If the duty was estimated to be the source of a potential training problem then "YES" was entered in the column labeled, TENTATIVE SOLUTION: TRAIN, if not, then "NO" was entered. If additional hands-on practice was proposed as a solution then "YES" was placed in the column labeled, TRAINING: MORE HO, if not then "NO" was entered. If incorporating a job aid appeared to be an appropriate method of training the task, then "YES" was placed in the column labeled, TRAINING: JOB AID, if not, then "NO" was entered. If either or both these solutions was considered inadequate, or if a training device was being developed for training then "YES" was entered in the column labeled, TRAINING: TNG DEV, if not, then "NO" was entered. Again, a task or subtask receiving the same response as its respective duty area received an "X" or "(x)" under the appropriate heading, and those for which insufficient data was available received a question mark (?).

If the duty was identified as posing a potential assignment problem and the tentative solution offered was to seek methods for more appropriate assignment of crewmen, then "POS" (i.e., possible) was entered under the heading

labeled, TENTATIVE SOLUTION: ASSIGN. Where a task or subtask received the same response as its respective duty area, an "X" or "(x)" was entered under the appropriate heading. Question marks (?) appear where the data was insufficient to make a judgment.

The third heading or division (see example below) contains information concerning training delivery. If a duty listed also appeared in the DTD list

XM1 TASK LIST (GUNNER)	TRAINING DELIVERY DATA					
	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE		
				OSUT	TRANS	UNIT
VI. PERFORM TIS CHECKOUT						
33. Prepare TIS for Operation				X	X	

then a "YES" was placed across from that duty in the column titled, DTD TASK. Where specific tasks or subtasks were found in the DTD list, an "X" or "(x)", respectively, was placed opposite that specific task. The second column, SKILL LEVEL, presents the military rating of the lowest standard (level) of skill required to perform the task. For example, skill level 1 is that level attained by the soldier upon completion of OSUT. The third column, TRNG TYPE, presents the information from the DTD task analyses regarding where the task is to be trained. The letter "X" refers to resident (school) training, "Y" represents non-resident (unit) training, and "Z" denotes that the task was listed but not selected for formal training either in the school (OSUT) or in the unit. Under the heading, TRAINING SITE, are three locations: OSUT, TRANS, and UNIT. An "X" in these columns across from a particular task specifies that the task is listed for school training (OSUT) at Fort Knox, for transition training (TRANS) based on OT III, or for formal training (UNIT) on-the-job. An asterisk (*) in the TRANS column opposite each task indicates that during

OT-III, 20 percent or more of the soldiers being trained failed to meet the minimum acceptable level of performance required to accomplish the task. Training site was included in the analyses to distinguish between locations specified by the DTD list and locations noted in training documentation.

Table V contains tasks which involve crew interaction, that is, the appropriate combat performance of these tasks would involve two or more crewmen. By definition collective training is required for these tasks. Because all collective training is the primary responsibility of TO&E units, the TRAINING DELIVERY DATA section is not applicable and therefore is not included in Table V. However, all other analyses were conducted in the same manner as presented for Tables I through IV.

FINDINGS

The findings reported herein are based on the subjective analyses of the data presented in Tables I-V. The summary statements presented concern only the major trends in the data considered to be of interest to members of the Armor community.

The majority of XM1 tasks which are directly analogous to M60A1 tasks are easier to perform on a fully operational XM1 tank. Performance of these same tasks on a non-fully operational XM1 are almost identical in difficulty to M60A1 tasks. For example, tracking a moving target is easier on the XM1 because the appropriate lead is automatically applied as the gunner lays on, ranges and tracks the target. In the fully operational M60A1 the gunner must apply varying amounts of lead based on target speed and the type of ammunition being fired. Performance of these same tasks in a non-fully operational XM1 is almost identical in degree of difficulty to performance of these tasks in a fully operational M60A1. When automatic lead in the XM1 has, for some

reason, malfunctioned lead must be applied in the same manner as on the fully operational M60A1.

Tasks which are unique to the XM1 are often difficult on a fully operational XM1 and almost always very difficult on a non-fully operational XM1. For example, the XM1 employs a laser rangefinder which is much faster and more accurate than the coincidence rangefinder found in the M60A1. However, unwanted multiple or inaccurate laser returns make it necessary for the tank commander to constantly verify the laser range return based on his estimate of the actual range to target. Therefore, laser ranging on the XM1 contains a larger cognitive component than does coincidence ranging on the M60A1. In the event of a laser rangefinder malfunction (non-fully operational XM1), the tank commander has the unique capability of inputing an estimated range into the computer by means of a manual range add/drop toggle switch and firing precision. For small adjustments, the switch is held for four seconds to make range changes at a speed of fifty meters a second. For large adjustments, the switch is held for more than four seconds to make range changes at a speed of 500 meters a second. Thus, ranging in a degraded mode can significantly increase task difficulty by requiring precision adjustments under stressful conditions induced by time constraints.

Automation in XM1 equipment design has made operator task performance during normal target engagements easier, but has conversely increased the scope and complexity of preoperational tasks during normal and degraded conditions. On the surface it appears that target engagements under normal operating conditions on the XM1 are much simpler and less demanding than M60A1 requirements. The XM1 ballistic computer automatically adjusts for lead, cant, wind, ammo temperature, barometric pressure, air temperature and gun tube wear; factors

which in the M60A1 must be compensated for by the operator. However, in order for the ballistic computer on the XM1 to make these adjustments automatically, it becomes necessary for the operator to perform an extensive series of pre-operational computer programming steps. Data must be entered in sequence for each factor based on current operating conditions and then verified to ensure proper entry. When conditions warrant degraded modes of operation, the operator must respond correctly to one or more of eight digitally-coded warning signals and then apply the appropriate procedures necessary to null-out the effects of these malfunctions in the fire control system. Later, as time permits, the operator must follow established troubleshooting procedures specified for the particular fire control system malfunctions. To date, there are 31 troubleshooting tasks for the XM1 fire control system alone.

GLOSSARY OF TERMS

CATEGORY	RATINGS			ISSUES ADDRESSED
	Duty	Task	Subtask	
COMMON-ALITY	UNIQUE	U	(u)	Is the XM1 task unique to the XM1, different from the M60A1 or the same as on the M60A1?
	DFRNT	D	(d)	
	SAME	S	(s)	
TASK PERFORM: EASIER / HARDER	YES	X	(x)	Is the XM1 task easier or harder to perform than it's M60A1 counterpart?
	NO	X	(x)	
PROBLEM: TRAIN / ASSIGN	YES	X	(x)	Is performance of the XM1 tank a potential training or assignment problem? (POS = possible)
	POS	?	(?)	
	NO	X	(x)	
CAUSE: MENTAL / MOTOR	YES	X	(x)	Is the cause of the potential problem primarily mental (cognitive) or motor (psychomotor)?
	NO	X	(x)	
JOB SAMPLE	YES	X	(x)	Does the XM1 task have the potential to serve as a "job sample" test? (POS = possible)
	POS	?	(?)	
	NO	X	(x)	
TENTATIVE SOLUTION: SELECT / TRAIN	YES	X	(x)	Is the solution to the potential problem likely to be found in selecting special personnel or in using special training techniques? (POS = possible)
	POS	?	(?)	
	NO	X	(x)	
TRAINING: MORE HO / JOB AID / TRNG DEV	YES	X	(x)	If special training techniques are suggested, would more hands-on training, job aids or training devices be applicable?
	NO	X	(x)	
DTD TASK	YES	X	(x)	Did the XM1 task appear in the DTD list of tasks selected for training?
	NO	X	(x)	
SKILL LEVEL	1	X	(x)	If the XM1 task appeared in the DTD list, what was its skill level rating?
	2	X	(x)	
	3	X	(x)	
TRNG TYPE	X	X	(x)	If the XM1 task appeared in the DTD list, where was it designated for training, i.e., OSUT (X), unit (Y), or not selected for formal training (Z)?
	Y	X	(x)	
	Z	X	(x)	
TRAINING SITE: OSUT / TRANS / UNIT	YES	X	(x)	Based on a review of training materials developed for the XM1, where is the task trained? (Asterisk (*) in the TRANSition column denotes > 20% failure rate at OT III.)
	NO	X	(x)	
	*	*	*	

TABLE I

XM1 TASK LIST

(TANK COMMANDER)

XM1 TASK LIST (TANK COMMANDER)	NGOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM		PROBLEM		CAUSE		JOB			MORE	JOB	TRNG	DTD	SKILL	TRNG	TRAINING SITE		
		EASIER	HARDER	TRAIN	ASSIGN	MOTOR	MENTAL	SAMPLE	SELECT	TRAIN	NO	AID	DEV	TASK	LEVEL	TYPE	OSUT	TRANS	UNIT
1. PERFORM BEFORE OPERATION PMCS (EXTERIOR)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	NO	YES	NO	YES	1	X	YES	YES	NO
1. Supervise PMCS	D		X	X			X			X		X		X	3	X			
11. PREPARE STATION FOR OPERATION (Tasks #2 thru 20)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	3	X	YES	YES	NO
2. Enter the Cdr's Station	S																	X	
3. Power-Up Cdr's Station & Turret	U			X			X			X	X		X					X	
a. Master Power Switch	(u)			(x)			(x)			(x)	(x)		(x)						
b. Turret Power/Engine ON	(u)			(x)			(x)			(x)	(x)		(x)						
c. Aux Power/Engine OFF	(u)			(x)			(x)			(x)	(x)		(x)						
4. Check Operation of Cdr's Panel Switches and Lights	D	X																X	
5. Replace Panel Lamps	D																	X	
6. Adjust Cdr's Panel Lamp Brightness	D																	X	
7. Operate Cdr's Hatch (3 Positions)	D		X	X		X				X	X							X	
a. Raise/Lower CWS Hatch to Protected Open	(u)			(x)		(x)				(x)	(x)								
b. Raise CWS Hatch to Full Open	(d)		(x)	(x)		(x)				(x)	(x)								
c. Close CWS Hatch	(u)			(x)		(x)				(x)	(x)								
8. Adjust Cdr's Seat	S																	X	
a. Raise/Lower Cdr's Seat	(s)																		
9. Adjust Cdr's Platform	D																	X	
a. Raise/Lower Cdr's Lower Platform	(s)																		

XM1 TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM		PROBLEM		CAUSE		JOB			MORE	JOB	TRNG	DTD	SKILL	TRNG	TRAINING SITE		
		EASIER	HARDER	TRAIN	ASSIGN	MOTOR	MENTAL	SAMPLE	SELECT	TRAIN	HO	AID	DEV	TASK	LEVEL	TYPE	OSUT	TRANS	UNIT
b. Raise/Lower Cdr's Middle Platform	(d)																		
10. Adjust Cdr's Knee Guard	U																	X	
a. Stow/Unstow Cdr's Knee Guard	(u)																		
11. Operate Domelight	D	X																	
a. Select Domelight Filters (Red/White)	(d)	(x)																	
b. Turn Domelight ON/OFF	(d)	(x)																	
c. Adjust Domelight Brightness	(d)	(x)																	
III. PERFORM BEFORE OPERATIONS PMCS (INTERIOR)	DFRNT	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	1	X	YES	YES	NO
12. Operate Radio Set With Intercom System	S			X			X			X	X			X	I	X		X	
a. Connect/Disconnect CVC Helmet to Intercom	(s)													(x)	1	(x)			
b. Intercom Without Remote Control	(s)													(x)	(1)	(x)			
c. Intercom Using Thumb Control Switch	(u)													(x)	(1)	(x)			
d. Set Tactical Radio	(d)	(x)												(x)	(1)	(x)			
IV. ADJUST CDR'S GPS EXTENSION (GPSE)	DFRNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	NO	3	?	NO	YES	NO
13. Operate Ballistic Doors	D																	X	
a. Open/Close Ballistic Doors	(d)																		
14. Adjust GPSE Brow Pad	D																	X	
15. Adjust GPSE Focus Using Diopter Ring	D																	X	
16. Check GPSE for Moisture, Fungus, Scratches and Clean GPSE Optics	D													X	I	Y			X

XM1 TASK LIST (TANK COMMANDER)	MOOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CONDITIONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
V. INSTALL CDR'S WEAPON	DFRNT	YES	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	3		YES	YES	
17. Install Cal.50 Receiver	D	X												X	3	X	X	X*	
18. Install Cal .50 Barrel	S	X															X		
19. Set Cal .50 Headspace and Timing	D			X			X			X	X			X	1	X	X	X*	
20. Test Cal .50 Firing Mechanism	D																	X	
VI. OPERATE COMMANDER'S MANUAL RANGE CONTROLS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	NO	?	?	NO	YES	?
21. Set Indexed Battlerange into Computer	D			X			X	?		X	X		X					X	
22. Adjust Battlerange Using Toggle Switch	U			X		X	X	?		X	X		X					X	
a. Make Small Range Adjustments	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
b. Make Large Range Adjustments	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
c. Return to Original Range	(u)																		
VII. OPERATE TC TURRET POWER CONTROL HANDLE	SAME	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	NO	3	?	NO	YES	NO
23. Test Turret Power Traverse Operation	S																		
24. Check Turret Override Capability	S																		
VIII. OPERATE COMMANDER'S WEAPON STATION (CWS) IN POWER MODE	UNIQUE	NO	YES	YES	NO	YES	NO	NO	NO	YES	YES	NO	NO	NO	3	?	NO	YES	NO
25. Place CWS in Power Mode	U																	X	
26. Remove/Install CWS Power (Azimuth) Control Handle	U																	X	

XM1 TASK LIST (TASK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE SKILL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
27. Traverse CWS Using Power Control Handle	I			X		X				X	X							X	
IX. OPERATE COMMANDER'S WEAPON STATION (CWS) IN MANUAL MODE	DFRNT	NO	YES	YES	NO	YES	NO	NO	NO	YES	YES	NO	NO	NO	3	?	NO	YES	NO
28. Place CWS in Manual Mode	D																	X	
29. Traverse the CWS Manually	D		X	X		X				X	X							X	
X. OPERATE CWS SIGHT (CWSS)	DFRNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	NO	3	?	NO	NO	NO
30. Adjust CWSS Brow Pad	D																		
31. Adjust CWSS Focus Using Diopter Ring	S																		
32. Check CWSS for Moisture, Fungus, Scratches and Clean CWSS Optics	S																		
XI. OPERATE THE COMMANDER'S WEAPON/STATION/SIGHT	DFRNT	NO	YES	YES	NO	YES	NO	NO	NO	YES	YES	NO	NO	NO	3	?	NO	YES	NO
33. Load Cal .50 Machinegun	D	X																X	
34. Lock/Unlock Cal .50 Machinegun	D																	X	
35. Elevate/Depress Cal .50 Using Elevation Crank Handle	D		X	X		X				X	X							X	
36. Boresight Cal .50 Machinegun	D		X	X			X			X	X			X	3	X	X	X	
37. Fire Cal .50 Machinegun Using Elevation Crank Handle	D		X	X		X				X	X							X	
38. Fire Cal .50 Machinegun Using Trigger on Cal .50	S			X		X				X	X							X	
39. Zero Cal .50 Machinegun	S			X			X			X	X			X	3	X	X	X	

XM1 TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
40. Clear Cal .50 Machinegun	S	X		X			X			X	X			X	1	X	X	X*	
41. Apply Immediate Action to Cal .50 Machinegun	S	X		X			X			X	X							X	
a. Fail to Fire	(s)	(x)		(x)			(x)			(x)	(x)								
b. Runaway Gun	(x)	(x)		(x)			(x)			(x)	(x)								
42. Unload Cal .50 Machinegun	D	X												X	1	X		X	
XII. OPERATE M250 GRENADE LAUNCHER	DFRNT	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	3	?	NO	YES	NO
43. Fire M250 Grenade Launcher	D																	X	
a. Fire SALVO 1	(d)																		
b. Fire SALVO 2	(d)																		
c. Fire Both SALVOs	(d)																		
44. Apply Immediate Action to M250 Grenade Launcher	S			X			X			X	X							X	
a. Misfire	(s)			(x)			(x)			(x)	(x)								
b. Fail to Burn/Burst	(s)			(x)			(x)			(x)	(x)								
XIII. PREPARE WEAPONS FOR TRAVEL	DFRNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	NO	NO
45. Prepare Cal .50 Machinegun For Travel	P																X		
XIV. OPERATE GAS PARTICULATE FILTER SYSTEM	SAME	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
46. Clear & Seal Protective Mask (M25)	S													X	1	X			
47. Check Filter, Hose and Connections	S													X	1	X		X	
48. Check Intercom Connections	S																		

XM1 TASK LIST (TANK COMMANDER)	MODAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
49. Check Heater Lamp Light	S																	X	
50. Adjust Heater Temperature	S																	X	
51. Stow/Unstow Mask	S																		
XV. OPERATE FIRE EXTINGUISHERS	DFRNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
52. Operate External Fire Extinguisher Handle	S																		
53. Operate Portable Fire Extinguishers	S																		
54. Check Fire Extinguisher Pressure Gauges (Reference Ambient Temperature)	U																	X	
55. Maintain Fire Sensor Sensors	U																	X	
XVI. OPERATE NIGHT VISION GOGGLES (AN/PVS-5)	SAME	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	Y	NO	NO	YES
56. Stow/Unstow AN/PVS-5 Goggles	S																		
57. Place AN/PVS-5 Goggles Into Operation	S													X	1	Y			X
58. Maintain AN/PVS-5 Goggles	S													X	1	Y			X
XVII. PREPARE COMMANDER'S STATION FOR ALTERNATE WEAPON	UNIQUE	NA	NA	YES	NO	YES	NO	NO	NO	YES	YES	NO	NO	YES	1	X	NO	YES	YES
59. Install M240 Machinegun	D			X		X				X	X			X	1	Y		X*	X
60. Load M240 Machinegun	D			X		X				X	X			X	1	Y			X
61. Fire M240 Machinegun	D			X		X				X	X			X	1	Y			X
62. Remove M240 Machinegun	D			X		X				X	X			X	1	Y			X
XVIII. PERFORM "DURING" OPERATIONS PMCS (REPEAT TASK #1)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	NO	YES	YES	1	Y	YES	NO	NO
63. Check Cdr's Panel Mounting Lights, and Controls	D																		

XM1 TASK LIST (TASK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DED TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
64. Monitor Cdr's Panel Warning Lights	U			X			X			X	X		X						
65. Check Operation of Cal .50	D													X	1	X			
IX. PERFORM "AFTER" OPERATION PMCS (REPEAT TASKS #1)	DFRNT	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
XX. POWER DOWN AND SECURE COMMANDER'S STATION	DFFNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	3	X	YES	YES	NO
66. Remove Cal .50 Machine-gun	D	X												X	3	X	X	X	
67. Power Down CWS and Turret	D																	X	
68. Secure Station	D													X	3	X	X	X	NO
a. Lock Cdr's Hatch	(d)																		
b. Exit Tank	(s)																		
XXI. PERFORM PRE-FIRE PMCSs (REPEAT TASKS #19, 3e)	UNIQUE	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	3	?	NO	YES	?
69. Check Cal .50 Mounting	D																		
70. Check Cal .50 Ammo Stowed in Ready Box	D																		
XXII. PERFORM PREPARE TO FIRE CHECKS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	YES	3	X	YES	YES	NO
71. Prepare to Fire Main Gun (7 Tasks)										X	X		X						
a. Normal	(d)		(x)	(x)			(x)	(?)		(x)	(x)								
b. Degraded	(d)		(x)	(x)			(x)	(?)		(x)	(x)		(x)						
72. Prepare to Fire Coax (6 Tasks)	D		X	X			X	?		X	X		X						
a. Normal	(d)		(x)	(x)			(x)	(?)											
b Degraded	(d)		(x)	(x)			(x)	(?)											

XXII TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CONDITIONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXIII. TARGET ACQUISITION	DFRNT	YES	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	NO	3	?	NO	YES	?
73. Acquire Targets From Full Open Hatch Using Naked Eye	S			X			X	?		X	X		X					X	
74. Acquire Targets From Full Open Hatch Using Binoculars	S			X			X	?		X	X		X						
75. Acquire Targets From Protected Open (Popped) Hatch Using Naked Eye	U			X			X	?		X	X		X						
76. Acquire Targets From Popped Hatch Using Binoculars	U			X			X	?		X	X		X						
77. Acquire Targets From Closed Hatch Using Unity Windows	S	X		X			X	?		X	X		X						
78. Acquire Targets From Closed Hatch Using CMSS	S			X			X	?		X	X		X						
79. Acquire Targets From Closed Hatch Using Binoculars	S	X		X			X	?		X	X		X						
80. Acquire Targets at Night Using Night Vision Goggles	S	X		X			X	?		X	X		X						
81. Acquire Targets From Turret Defilade	S	X		X			X	?		X	X		X						
82. Acquire Targets From Hull Defilade	S	X		X			X	?		X	X		X						
83. Acquire Targets While Stationary	S	X		X			X	?		X	X		X					X	
84. Acquire Targets While Moving	D		X	X			X	?		X	X		X					X	
XXIV. TARGET ENGAGEMENT WITH MAIN GUN (NORMAL) (GPSE)	DFRNT	YES	YES	YES	POS	YES	YES	YES	POS	YES	YES	NO	YES	YES	3	X	NO	YES	?
85. Establish Weapon System Operating Conditions For NORMAL Mode	D							?											

XM1 TASK LIST (TASK COMMANDER)	MSOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA				
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MDRE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
a. Designate Gun Select Mode	(d)							(?)										
b. Designate Ammo Select Mode	(d)							(?)										
c. Designate LRFD Mode	(u)			(x)			(x)	(?)										
86. Issue Main Gun Precision Fire Commands	D							?						X	3	Z		X*	
Lay Main Gun For Direction:																			
87. Stat/Stat	S	X																X	
88. Stat/Moving (Track)	S	X		X		X		?	?	X	X		X					X	
89. Moving/Stat (Track)	U			X	?	X		?	?	X	X		X					X	
90. Moving/Moving (Track)	U			X	?	X		?	?	X	X		X					X	
Decide to Hand-Off Target to Gun or Engage:																			
91. Release Turret Control (Override)	S							?										X	
92. Announce "From My Position" and Engage	S							?											
Lay On Target To Be Engaged (CPSE):																			
93. Stat/Stat	S	X																X	
94. Stat/Moving (Track)	S	X		X	?	X		?	?	X	X		X					X	
95. Moving/Stat (Track)	U			X	?	X		?	?	X	X		X					X	
96. Moving/Moving (Track)	U			X	?	X		?	?	X	X		X					X	
97. Determine Range to Target Using LRF/CPSE (Lase on Center-of-Mass)	U			X		X		?		X	X		X	X	3	X		X	
98. Verify Main Gun Firing Status	U			X	?		X	?	?	X	X		X					X	
a. Check/Respond to Multiple Return	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						

	XM1 TASK LIST (TASK CONSUMER)	MEOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
		CONSEQUENCE	TASK PERFORM.		PROBLEM		CAUSE		JOB SAMPLE			MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE		
			EASIER	HARDER	TRAIN	ASSIGN	MOTOR	MENTAL		SELECT	TRAIN							OSUT	TRADS	UNIT
	b. Check/Respond to Fault Symbol	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
99.	Fire Main Gun	S																		
100.	Respond to Main Gun Misfire	D			X			X			X	X								
	Round Sense (GPSE):																			
101.	Stat/Stat	D	X																	
102.	Stat/Moving (Track)	D	X		X			X	?		X	X		X						
103.	Moving/Stat (Track)	U			X		X	X	?		X	X		X						
104.	Moving/Moving (Track)	U			X		X	X	?		X	X		X						
	Adjust Fire (GPSE):																			
105.	Apply Re-Engage Method	U			X		X	X			X	X		X						
106.	Apply BOT	S/U	S	U	X		X	X			X	X		X						
107.	Correct Range Using Toggle Switch	U			X		X	X	?		X	X		X						
108.	Apply Standard Range Correction	S/U	S	U	X		X	X			X	X		X						
XXV.	TARGET ENGAGEMENTS WITH MAIN GUN (NORMAL/EMERGENCY) (TIS)	DFIGHT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	NO	3	?	NO	NO	?
	Lay On Target (TIS):																			
109.	Stat/Stat	U			X			X	?		X	X		X						
110.	Stat/Moving (Track)	U			X	?	X	X	?	?	X	X		X						
111.	Brief Halt	U			X	?	X	X	?	?	X	X		X						
112.	Moving/Stat (Track)	U			X	?	X	X	?	?	X	X		X						
113.	Moving/Moving (Track)	U			X	?	X	X	?	?	X	X		X						
114.	Determining Range to Target Using LRF/TIS (Lase on Center-of-Mass)	U			X	?		X	?	?	X	X		X	X	3	X			

XM1 TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
Round Sense (TIS):																			
115. Stat/Stat	U			X			X	?		X	X		X						
116. Stat/Moving	U			X	?	X	X	?	?	X	X		X						
117. Brief Halt	U			X	?		X	?	?	X	X		X						
118. Moving/Stat	U			X	?	X	X	?	?	X	X		X						
119. Moving/Moving	U			X	?	X	X	?	?	X	X		X						
Adjust Fire (TIS):																			
120. Apply Re-Engage Method	U			X	?	X	X	?	?	X	X		X						
121. Apply BOT	U			X	?	X	X	?	?	X	X		X						
122. Correct Range Using Toggle Switch	U			X	?	X	X	?	?	X	X		X						
123. Apply Standard Range Correction	U			X	?	X	X	?	?	X	X		X						
XXVI. TARGET ENGAGEMENTS WITH MAIN GUN (EMERGENCY) (GPSE)	DFERT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	NO	3	?	NO	YES	?
124. Establish Weapon System Operating Conditions For EMERGENCY Mode	D							?											
a. Designate Gun Select Mode	(d)							(?)											
b. Designate Ammo Select Mode	(d)							(?)											
c. Designate LRFD Mode	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)								
Lay Main Gun For Direction:																			
125. Stat/Stat	S																		
126. Stat/Moving	S			X	?	X			?	X	X		X						
127. Brief Halt	S/U		U	X	?	X			?	X	X		X						

XM1 TASK LIST (TASK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
Lay On Target:																			
128. Stat/Stat	S	X																	
129. Stat/Moving	S	X		X	?	X	X		?	X	X		X						
130. Brief Halt	S/U		U	X	?	X			?	X	X		X						
131. Apply Manual Leads	S			X	?	X	X	?	?	X	X		X					X	
XXVII. TARGET ENGAGEMENT WITH MAIN GUN (MANUAL)	SAME	YES	YES	YES	POS	YES	NO	POS	POS	YES	YES	NO	YES	NO	3	?	NO	YES	?
132. Establish Weapon System Operating Conditions For MANUAL Mode	D							?											
a. Designate Gun Select Mode	(d)							(?)											
b. Designate Ammo Select Mode	(d)							(?)											
Lay Main Gun For Direction:																			
133. Direct Gunner Onto Target	S/U	S	U																
134. Estimate/Announce Direction	S/U	S	U	X	?		X	?	?	?	X		X					X	
XXVIII. ENGAGE TARGETS USING BATTLESIGHT GUNNERY (CPSE)	SAME	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	NO	3	?	NO	YES	?
135. Issue Battlesight Fire Command	S/U	S	U											X	3	Z		X	
136. Depress Battlesight Button	U																	X	
137. Apply Battlesight Gunnery Technique	S/U	S	U	X	?	X	X	?	?	X	X		X						
138. Modify Battlesight Aim	S/U	S	U	X	?	X	X	?	?	X	X		X						
Adjust Fire:																			
139. Apply Target Form	S/U	S	U	X	?	X	X	?	?	X	X		X						
140. Toggle Range Correction	U			X	?	X	X	?	?	X	X		X						

XM1 TASK LIST (TASK COMMANDER)	MOAA TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	DIMENSIONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXIX. ENGAGE TARGETS USING RANGE CARD DATA	DPRNT	NO	NO	NO	NO	NA	NA	POS	NO	YES	YES	NO	YES	NO	3		NO	NO	?
141. Prepare Range Cards	D							?						X	3	Z			
142. Issue Range Card Fire Command	D			X			X	?		X	X		X	X	3	Z			
XXX. RESPOND TO SPECIFIC FIRE CONTROL SYSTEM FAILURES	DPRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES	NO	3	?	NO	YES	?
143. Respond to GPSE Failure	D									X	X		X						
a. Use TIS(T)	(u)									(x)	(x)		(x)						
144. Respond to TIS(T) Failure	D									X	X		X						
a. Use GPSE	(u)									(x)	(x)		(x)						
145. Respond to Laser Range-finder Failure	D			X	?	X	X	?	?	X	X		X					X	
a. Determine Range Using Non-Ballistic Reticle	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
b. Estimate Range and Announce	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
c. Estimate Range and Toggle	(u)			(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
d. Employ Battlesight Gunnery	(u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
146. Respond To Crosswind Sensor Failure	D			X	?		X	?	?	X	X		X						
a. Cancel Crosswind Input	(u)			(x)			(x)	(?)		(x)	(x)		(x)						
b. Aim High/Opposite Direction	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
147. Respond to Cant Sensor Failure	D			X	?		X	?	?	X	X		X						
a. Cancel Cant Input	(u)			(x)			(x)	(?)		(x)	(x)		(x)						
b. Apply Aim-Off	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						

XM1 TASK LIST (TASK COMMANDER)	NSQAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
148. Respond to Lead Angle Sensor Failure	U			X	?		X	?	?	X	X		X						
a. Cancel Lead Angle Input	(u)			(x)			(x)	(?)		(x)	(x)								
b. Apply Manual Lead	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
149. Respond to Combined Failures	U			X	?		X	?	?	X	X		X						
XXX1. TARGET ENGAGEMENTS WITH COAX (NORMAL/EMER) (GPSE)	DPRNT	YES	YES	YES	NO	YES	YES	POS	NO	YES	YES	NO	YES	YES	3	Y	NO	NO	YES
150. Issue Coax Fire Command	S													X	3	Z			
151. Determine Range to Coax Targets Using LRF/GPSE (Lase on Target Base)	U			X		X	X			X	X		X	X	3	X	X		
152. Fire Coax In 20-25 Round Bursts	S																		
153. Adjust Coax Fire (GPSE)	S			X		X	X	?		X	X		X						
a. Apply a Walk-In Technique (Moving)	(s/u)	(s)	(u)	(x)		(x)	(x)	(?)		(x)	(x)		(x)						
b. Apply Z-Pattern (Moving)	(s/u)	(s)	(u)	(x)		(x)	(x)	(?)		(x)	(x)		(x)						
XXX11. TARGET ENGAGEMENTS WITH COAX (NORMAL/EMER) (TIS)	UNIQUE	NA	NA	YES	NO	YES	YES	POS	NO	YES	YES	NO	YES	NO	3	Y	NO	NO	YES
154. Determine Range to Target Using LRF/TIS (Lase on Target Base)	U			X		X	X	?		X	X		X	X	3	X	X		
155. Adjust Coax Fire (TIS)	D	X		X		X	X	?		X	X		X						
a. Apply a Walk-In Technique	(d)	(x)								(x)	(x)		(x)						
b. Apply Z-Pattern	(d)	(x)								(x)	(x)		(x)						

XM1 TASK LIST (TANK COMMANDER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	[illegible]-ALITY	PERFORM EASIER	PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXXIII. TARGET ENGAGEMENTS WITH CAL .50 (NORMAL)	DFRNT	NO	YES	YES	POS	YES	[illegible]	YES	POS	YES	YES	NO	YES	YES	1	X	YES	NO	NO
Traverse to Target:																			
156. Power Traverse Turret To Target	S																		
157. Power Traverse CWS To Target	U			X		X		?		X	X		X						
Range On Target:																			
158. Range To Cal .50 Targete Using LRFD (Base on Base of Target)	U			X			X	?		X	X		X	X	3	X	X		
159. Estimate Range To Cal .50 Target	S			X	?		X	?	?	X	X		X						
Lay On Target Using CWS Power/Manual Controls:																			
160. Stat/Stat	U			X	?	X		?	?	X	X		X						
161. Stat/Moving	U			X	?	X	X	?	?	X	X		X						
162. Moving/Stat	U			X	?	X	X	?	?	X	X		X						
163. Moving/Moving	U			X	?	X	X	?	?	X	X		X						
164. Fire Cal .50 Using Manual Elevation Control Handle Trigger	D			X		X		?		X	X		X						
165. Adjust Cal .50 Fire Using Power/Manual Controls	U			X	?	X	X	?	?	X	X		X						
a. Apply Walk-In Technique	(u)			(x)		(x)	(x)	(?)		(x)	(x)		(x)						
b. Apply Z-Pattern	(u)			(x)		(x)	(x)	(?)		(x)	(x)		(x)						
c. Apply Turret-Carry Method (With Gunner)	(u)			(x)		(x)	(x)	(?)		(x)	(x)		(x)						

XM1 TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXXIV. TARGET ENGAGEMENTS WITH CAL .50 (MANUAL)	DFRNT	NO	YES	YES	POS	YES	NO	POS	POS	YES	YES	NO	YES	NO	3	?	?	NO	?
166. Manually Traverse CWS To Target	D		X	X	?	X	N	?	?	X	X		X						
Lay On Target Using Manual Controls:																			
167. Stat/Stat	D		X	X		X				X	X		X						
168. Stat/Moving	D		X	X		X	X			X	X		X						
169. Moving/Stat	D		X	X	?	X		?	?	X	X		X						
170. Moving/Moving	D		X	X	?	X	X	?	?	X	X		X						
171. Adjust Cal .50 Fire Using Manual Controls	D		X	X	?	X	X	?	?	X	X		X						
a. Apply Walk-In Technique	(d)		(x)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
b. Apply Turret-Carry Method (With GNK)	(d)		(x)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
XXXV. ENGAGE MULTIPLE/ SIMULTANEOUS TARGETS	DFRNT	YES	YES	YES	POS	NO	YES	POS	POS	YES	YES	NO	YES	NO	3	?	NO	NO	?
172. Determine Most Dangerous	S/U	S	U	X	?		X	?	?	X	X		X						
173. Issue Multiple Target Fire Command	S/U	S	U	X			X	?		X	X		X						
174. Issue Simultaneous Target Fire Command	S/U	S	U	X			X	?		X	X		X						
175. Dump Automatic Lead	U			X			X	?		X	X		X						
XXXVI. ENGAGE TARGETS USING SMOKE	DFRNT	YES	YES	YES	NO	NO	YES	NO	NO	YES	YES	NO	YES	NO	3	?	NO	NO	?
176. Engage Targets Using Engine Smoke Generator	U			X			X			X	X		X						
177. Engage Targets Using Grenade Launcher System	S/U	S	U	X			X			X	X		X						

XM1 TASK LIST (TANK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM		PROBLEM		CAUSE		JOB SAMPLE			MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE		
		EASIER	HARDER	TRAIN	ASSIGN	MOTOR	MENTAL		SELECT	TRAIN							OSUT	TRANS	UNIT
XXXVII. TROUBLESHOOT TURRET	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	NO	YES	1	X	YES	NO	?
178. Troubleshoot TC Indicator/Warning Lights (7 Tasks)	D		X	X	?		X	?	?	X	X	X		X	1	X			
a. Cdr's CKT BKR Light Fails	(u)			(x)			(x)			(x)	(x)	(x)							
b. CKT BKR Open Light	(u)			(x)			(x)			(x)	(x)	(x)							
c. Fire Control MALF Light	(u)			(x)			(x)			(x)	(x)	(x)							
d. Cdr's LOW BAT CHG Light	(u)			(x)			(x)			(x)	(x)	(x)							
e. Vehicle Master Power Light Fails	(u)			(x)			(x)			(x)	(x)	(x)							
f. Turret Power Light Fails	(d)			(x)			(x)			(x)	(x)	(x)							
g. Aux Hydr Power Light Fails	(u)			(x)			(x)			(x)	(x)	(x)							
179. Troubleshoot Fire Control System (5 Tasks)	D		X	X	?		X	?	?	X	X	X		X	1	X	X		
a. Unable to Power Traverse	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
b. Unable to Power Elevate	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
c. Unable to Fire Main Gun	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
d. Unable to Power Traverse CWS	(u)		(x)	(x)			(x)			(x)	(x)	(x)							
e. Unable to Lase	(u)			(x)			(x)			(x)	(x)	(x)							
180. Troubleshoot Cal .50 Machinegun	D			X	?		X	?	?	X	X	X							
a. Unable to Fire Cal .50	(d)			(x)			(x)			(x)	(x)	(x)							

XM1 TASK LIST (TASK COMMANDER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
181. Troubleshoot Auxiliary Systems (2 Tasks)	D			X	?		X	?	?	X	X	X					X		
a. Cdr's Gas Particulate Heater Fails to Heat	(s)			(x)			(x)			(x)	(x)	(x)					(x)		
b. M250 Grenades Do Not Fire	(d)			(x)			(x)			(x)	(x)	(x)							
182. Troubleshoot Tank Electrical System	D		X	X	?		X	?	?	X	X	X							
a. No Vehicle Master Power	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
b. No Hull Power	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
c. No Turret Power	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
XXXVIII. PERFORM DURING-FIRE PMCS (REPEAT TASKS #4, 183)	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	NO	YES	1	Z	YES	NO	NO
XXXIX. PERFORM POST-FIRE PMCS (REPEAT TASKS #14, 15, 16, 20, 23, 24, 27, 28, 29, 35)	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
183. Field Strip Cal .50 and Check Parts	D			X			X			X	X						X	X	
184. Clean and Lubricate Cal .50	S																X		
XXXX. LUBRICATE XM1 ACCORDING TO LUBRICATION ORDER (LO)	DFRNT	YES	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	Z	YES	NO	NO

TABLE II

XM1 TASK LIST

(GUNNER)

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
I. PERFORM BEFORE OPERATIONS PMCS (EXTERIOR)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
1. Check Vehicle Exterior	D		X	X			X			X	X	X					X	X	
2. Check Spenson Equipment Stowage For Completeness	D		X	X			X			X	X	X						X	
3. Check/Clean Exterior Optics	D																X	X	
II. PREPARE GUNNER STATION FOR OPERATION (II THRU VII) (TASKS #4 thru 43)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	1	X	YES	YES*	NO
4. Enter Gunner's (GNR) Station	S																X	X	
5. Power-Up GNR Station	D		X	X			X			X	X		X				X	X	
a. Master Power Switch	(u)			(x)			(x)			(x)	(x)		(x)				(x)	(x)	
b. Turret Power-Engine On	(d)		(x)	(x)			(x)			(x)	(x)		(x)				(x)	(x)	
c. Aux. Power-Engine Off	(u)			(x)			(x)			(x)	(x)		(x)				(x)	(x)	
III. PERFORM BEFORE OPERATIONS PMCS (INTERIOR)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
6. Check Main Accumulator Pressure	D		X	X			X			X	X						X	X	
7. Check Aux. Hydraulic Pump	U			X			X			X	X						X	X	
8. Check Gunner's Power Gun/ Turret Control	D		X	X			X			X	X						X	X	
a. Check Power Traverse	(s)																(x)	(x)	
b. Check Power Gun Elevation	(s)																(x)	(x)	
9. Check Manual Gun/Turret Controls	D																X	X	
a. Check Manual Traverse	(d)																(x)	(x)	
b. Check Manual Gun Elevation	(d)																(x)	(x)	

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
c. Check Turret Power Controls Have No Effect When Manual Elevation Control Palm Lever is Depressed	(s)																(x)	(x)	
d. Check AZ/Elev Servo-Mech Filter Pop-Up Buttons	(u)			(x)			(x)			(x)	(x)						(x)	(x)	
e. Check Visible Hydraulic Lines For Leaks	(d)		(x)	(x)			(x)			(x)	(x)						(x)	(x)	
IV. CHECK OPERATION OF GUNNER PANEL SWITCHES, LIGHTS, AND CONTROLS	DFRNT	YES	NO	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	NO	?	?	YES	YES	NO
10. Test Panel Lights/ Switches	U																X	X	
11. Replace Panel Lamps	D																X		
12. Adjust GPS and TIS Panel Lamp Brightness	D																X	X	
13. Maintain Fire Sensor Lenses	U																X	X	
14. Check Hydraulic Pressure Gauge	D		X	X			X			X	X	X					X	X	
15. Adjust Gunner's Seat	D																X	X	
a. Raise/Lower Seat	(d)																(x)		
b. Slide Seat Front/Rear	(u)																(x)		
16. Position Chest Rest For Firing	U																X	X	
17. Adjust GPS Brow Pad	D																X		
18. Operate Domelight	D																X		
a. Select Domelight Filter (Red/White)	(d)																(x)		
b. Turn Domelight ON/OFF	(d)																(x)		

XM1 TASK LIST (GUNNER)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OUT	TRAINING SITE TRANS	TRAINING SITE UNIT
c. Adjust Domelight Brightness	(d)																(x)		
19. Operate Ballistic Doors	D																X	X	
a. Open/Close Ballistic Doors	(d)																(x)	(x)	
20. Operate Radio Set With Intercom System	S																X	X	
a. Connect/Disconnect CVC Helmet to Intercom	(s)													(x)	(1)	(x)	(x)		
b. Operate Intercom Without Remote Control	(s)													(x)	(1)	(x)	(x)		
c. Operate Intercom With Foot Button	(s)																(x)		
21. Test Computer Panel Lights	U																X	X	
V. PERFORM GPS FUNCTIONAL CHECK	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	NO	NO	NO	?	?	YES	YES	NO
22. Prepare GPS For Operation	P		X	X			Y			X	X						X	X	
a. Unlock Turret Traverse Lock	(s)																(x)		
b. Unlock Main Gun Travel Lock	(d)	(x)															(x)		
c. Set Gun/Turret Drive (GTD) to POWERED	(u)																(x)		
d. Set Fire Control Mode Switch to MANUAL	(u)																(x)		
e. Set THERMAL MODE Switch to STBY	(u)																(x)		
23. Check GPS Defroster	[illegible]																X	X	
24. Check Fire Control Mode Switch and Lights	D																X	X	
25. Check Gun Select Switch and Lights	D	X															X	X	

M1 TASK LIST (CONNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRADS	TRAINING SITE UNIT
26. Check Ammo Select Switch and Lights	D	X															X	X	
27. Select GPS FILTER/CLR/SHTR Position	U																X	X	
28. Check GPS Magnification	U																X	X	
29. Adjust GPS Reticle Brightness	D																X	X	
30. Adjust GPS Focus Using Diopter Ring	S																X		
31. Check for Gun or Turret Drift	U			X		X				X	X						X	X	
32. Null Out Reticle Drift	U			X		X	X	?		X	X						X	X	
VI. PERFORM TIS CHECKOUT	UNIQUE	NO	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	NO	NO	?	?	YES	YES	NO
33. Prepare TIS For Operation	U			X	?		X		?	X	X						X	X	
a. Prepare THERMAL MODE Switch In In STBY	(U)			(x)			(x)										(x)		
b. Select "SHTR" Position	(U)																(x)		
c. Set POLARITY Switch to WHITE HOT	(U)			(x)			(x)										(x)		
d. Set THERMAL MAGNIFICATION to 3X	(U)			(x)			(x)										(x)		
34. Check TIS Unit Test Patterns	U			X	?		X	?	?	X	X						X	X	
a. Check PCU	(U)			(x)			(x)			(x)	(x)						(x)	(x)	
b. Check CCU	(U)			(x)			(x)			(x)	(x)						(x)	(x)	
c. Check PU	(U)			(x)			(x)			(x)	(x)						(x)	(x)	
d. Check DRU	(U)			(x)			(x)			(x)	(x)						(x)	(x)	
35. Focus TIS Test Pattern	U			X	?	X	X		?	X	X						X		
a. Set at Contrast	(U)			(x)		(x)	(x)			(x)	(x)						(x)		

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
b. Adjust Sensitivity	(u)			(x)		(x)	(x)			(x)	(x)						(x)		
c. Adjust Reticle	(u)			(x)		(x)	(x)										(x)		
d. Check BLACK/WHITE HOT	(u)			(x)			(x)										(x)		
36. Adjust TIS Picture	U			X		X	X	?		X	Y						X	X	
a. Ensure Ballistic Doors Are Open	(u)																(x)	(x)	
b. Adjust Contrast	(u)			(x)		(x)				(x)	(x)						(x)	(x)	
c. Adjust Sensitivity	(u)			(x)		(x)				(x)	(x)						(x)	(x)	
d. Adjust Focus	(u)			(x)		(x)				(x)	(x)						(x)	(x)	
37. Adjust TIS Symbol Brightness	U			X			X										X	X	
VII. PERFORM GAS ADJUSTMENTS	DFRNT	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	NO	?	?	YES	YES	NO
38. Prepare GAS For Operation	D																X	X	
a. Ensure Turret Power is ON	(d)																(x)	(x)	
b. Turn Power Switch to ON	(u)																(x)	(x)	
39. Adjust GAS Brow Pad	D																X		
40. Adjust GAS Focus Using Diopter Ring	D																X	X	
41. Adjust Filter Knob To Reduce Glare (In/Out)	D																X	X	
42. Adjust GAS Reticle Brightness	D																X	X	
43. Check GAS Reticles	D																X	X	
VIII. INSTALL COAX MACHINEGUN	DFRNT	YES	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
44. Install M240 Machinegun	D	X												X	1	X	X	X	

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRADS	TRAINING SITE UNIT
IX. OPERATE COMPUTER CONTROL PANEL	UNIQUE	NO	YES	YES	POS	NO	YES	YES	POS	YES	YES	YES	YES	YES	1	X	YES	YES	NO
45. Manually Enter Data	U			X	?		X	YES	?	X	X		X	X	1	X	X	X*	
a. Into Manual Input Keys (6)	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
b. Into Auto Inputs Keys (4)	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
46. Cancel Manual Data Inputs	U			X	?		X	YES	?	X	X		X				X		
a. Into Manual Input Keys (6)	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
b. Into Auto Input Keys (4)	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
47. Toggle Switch Data Into Computer (See #51 (4))	U			X	?	X	X	?	?	X	X		X				X		
48. Enter Ammo Dependent Data Into Computer (2)	U			X	?		X	?	?	X	X		X				X		
49. Enter With Data Auto Input Into Computer (4)	U			X	?		X	?	?	X	X		X				X		
X. OPERATE THE BALLISTIC COMPUTER	DIFFRNT	NO	YES	YES	POS	NO	YES	YES	POS	YES	YES	YES	YES	NO	?	?	YES	YES	?
50. Perform Computer Self-Test	U			X	?		X	X	?	X	X	X	X				X	X	
a. Prepare For Self-Test (8 Tasks)	(u)			(x)	(?)		(x)	(x)	(?)	(x)	(x)	(x)					(x)		
b. Conduct Self-Test	(u)			(x)	(?)		(x)	(x)	(?)	(x)	(x)		(x)				(x)		
(1) If "Pass" Proceed to Next Step																	(x)		
(2) If "Fail" on Auto Input Take Corrective Action																	(x)		
(3) Option to By-Pass Failed Auto Computation																	(x)	(x)	

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	OTD TASK	SKILL L2VEL	TRNG TYPE	TRAINING SITE CSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
51. Perform Computer Data Check	U			X	?		X	YES	?	X	X	X	X				X		
a. MANUAL Data Check	(u)			(x)	(?)		(x)	(x)	(?)	(x)	(x)	(x)	(x)						
(1) AMMO TEMP																			
(2) BARO PRESS																			
(3) AIR TEMP																			
(4) MRS Indicator																			
(5) MRS BORESIGHT																			
b. Coax Machinegun Data Check	(u)			(x)	(?)		(x)	(x)	(?)	(x)	(x)	(x)	(x)				(x)		
(1) AMMO SUBDES																			
(2) BS ADJUST																			
(3) ZERO																			
c. Main Gun Data Check	(u)			(x)	(?)		(x)	(x)	(?)	(x)	(x)	(x)	(x)				(x)		
(1) AMMO SUBDES																			
(2) BS ADJUST																			
(3) ZERO																			
(4) (Repeat For All Ammos)																			
(5) TUBE WEAR																			
X1. TEST FIRE CONTROL SYSTEM	UNIQUE	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	NO	NO	?	?	NO	NO	?
52. Perform Lead System Check	U			X		X	X	?	?	X	X								
a. Prepare For Check (9 Tasks)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)								
b. Conduct Check	(u)			(x)	(?	(x)	(x)	(?)	(?)	(x)	(x)								

XM1 TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
53. Perform Firing Circuits Check	D		X	X			X			X	X	X							
a. Prepare For Check (5 Tasks)	(d)		(x)	(x)			(x)			(x)	(x)	(x)							
b. Conduct Check	(d)		(x)	(x)			(x)			(x)	(x)								
(1) Install Tester	(s)																		
(2) Check Blasting Machine	(d)																		
(3) Check Manual Elevation Trigger	(d)																		
(4) Check 2 Electrical Triggers	(d)																		
(5) Check Azimuth Inhibit Function	(u)			(x)			(x)	(?)		(x)	(x)								
(6) Check Elevation Inhibit Function	(u)			(x)			(x)	(?)		(x)	(x)								
(7) Check Gun Select and Gun Turret Drive Switches	(u)			(x)			(x)	(?)		(x)	(x)								
54. Conduct Crosswind Sensor Check	U			X			X	?		X	X								
a. Prepare For Check (3 Tasks)	(u)			(x)			(x)	(?)		(x)	(x)								
b. Conduct Check	(u)			(x)			(x)	(?)		(x)	(x)								
c. Clean Sensor	(u)																		
XII. CONDUCT MASTER GUNNER DETAILED CHECKS	UNIQUE	NO	YES	YES	POS	NO	YES	YES	POS	YES	YES	NO	YES	NO	?	?	NO	NO	NO
55. Perform Lead Accuracy Check	U			X	?		X	X	?	X	X		X						
56. Perform Super-Elevation Check	U		X	X	?		X	X	?	X	X		X						
57. Perform Cant Test Check	U			X	?		X	?	?	X	X		X						

XM1 TASK LIST (CONTD)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XIII. OPERATE MUZZLE REFERENCE SYSTEM	UNIQUE	NO	YES	YES	POS	YES	YES	POS	POS	YES	YES	YES	YES	NO	?	?	NO	YES	NO
58. Align Muzzle Reference System (MRS)	U			X	?		X	?	?	X	X		X					X	
a. Prepare For MRS Alignment (7 Tasks)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)							
b. Conduct MRS Alignment Check	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)					(x)	
c. Adjust GPS Reticle to MRS Reticle	(u)			(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)					(x)	
d. Enter MRS Data Into Computer	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)					(x)	
XIV. OPERATE COAXIAL MACHINEGUN (M240)	DFRST	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	1	X	YES	NO	NO
59. Fire Coax	D																X		
a. Fire Coax Electrically	(d)																(x)		
b. Fire Coax Manually	(d)																		
60. Clear Coax Machinegun	D			X			X			X	X			X	1	X	X		
61. Apply Immediate Action	D			X			X			X	X						X		
a. Respond to Coax Fail-To-Fire	(d)			(x)			(x)			(x)	(x)						(x)		
b. Respond to Runaway Gun (Coax)	(d)			(x)			(x)			(x)	(x)								
62. Clear Coax Barrels	D																X		
63. Empty Coax Spent Ammo Box	D																		
XV. [illegible] RANGEFINDER (LRF)	UNIQUE	YES	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	NO	?	?	NO	YES	NO
64. Check LRF For "1" Condition	U			X			X			X	X		X					X	

XM1 TASK LIST (CUMMER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
65. Arm The LRF	U																	X	
a. Arm Laser For First Return	(u)																	(x)	
b. Arm Laser For Last Return	(u)																	(x)	
66. Laser Firing	U			X			X	?		X	X		X					X	
a. Operate Laser For Continuous Firing	(u)			(x)			(x)			(x)	(x)		(x)					(x)	
b. Operate Laser For Rapid Firing	(u)			(x)			(x)			(x)	(x)		(x)					(x)	
XVI. BORESIGHT ARMAMENT	DFRNT	NO	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	NO	YES	1	X	YES	YES*	NO
67. Boresight Main Gun (With Eye Watson)	D		X	X	?	X	X	?	?	X	X			X	1	X	X	X	
68. Boresight GPS	D		X	X	?	X	X	?	?	X	X						X	X	
69. Boresight GAS	D		X	X		X	X	?		X	X						X	X	
70. UPDATE/Boresight MRS	U			X	?		X	?	?	X	X						?	X	
XVII. ZERO ARMAMENT	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES	YES	1	X	YES	YES	NO
71. Zero Main Gun	D		X	X	?		X	?	?	X	X	X	X	X	1	X	X	X*	
a. Prepare To Zero (12 Tasks)	(d)		(x)	(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)					(x)	(x)	
b. Fire For Zero (5 Rds Each)	(d)		(x)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)				(x)	(x)	
c. Fire For Confirmation (3 then 2 Tds to Repeat)	(d)		(x)	(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)	(x)				(x)	(x)	
72. Zero TIS	D			X		X	X			X	X	X	X	X	1	X	X	?	
73. Zero GAS	D			X		X	X			X	X	X	X				X	?	
74. Zero Coax (M240)	D			X			X			X	X		X	X	1	X	X	X	

XM1 TASK LIST (CONTINUED)	MISOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CONDITION-ALITY	TASK PERFORM. EASIER	TASK PERFORM. HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MODE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XVIII. ADJUST BATTLE RANGE	UNIQUE	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	YES	NO	?	?	NO	YES	NO
75. Pre-index Battlesight Range Data Into Computer	U			X			X			X	X		X					X	
a. BR Adjust SABOT	(u)			(x)			(x)			(x)	(x)		(x)					(x)	
b. BR Adjust HEAT	(u)			(x)			(x)			(x)	(x)		(x)					(x)	
c. BR Adjuet HEP	(u)			(x)			(x)			(x)	(x)		(x)					(x)	
XIX. OPERATE GAS PARTICULATE FILTER SYSTEM	SAME	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
76. Clear & Seal Protective Mask (M25)	S													X	1	X			
77. Check Filter, Hose, and Connections	S													X	1	X		X	
78. Check Intercom Connection	S													X	1	X			
79. Check Heater Lamp Light	S																	X	
80. Adjust Heater Temperature	S																	X	
81. Stow/Unstow Mask	S																		
XX. OPERATE FIRE EXTINGUISHERS	DPEND	NO	NO	NO	NO	NA	NA	NO	NO	NO	NO	NO	NO	YES	1	X	YES	NO	NO
82. Operate Exterior Fire Extinguisher Handle	S																		
83. Operate Portable Fire Extinguisher	S																		
84. Check Pressure Gauges Reference Ambient Temperature & Secure Mounte	U																		
XXI. PERFORM "DURING" OPERATIONS PMCSs (REPEAT TASK #1)	DPEND	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	Z	YES	NO	NO
XXII. PERFORM "AFTER" OPERATIONS PMCSs (REPEAT TASKS #8, 9, 14)	DPEND	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO

XM1 TASK LIST (GUNNER)	MOJAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXIII. POWER DOWN AND SECURE GUNNER STATION	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
85. Dismount Coax Machinegun	D	X												X	1	X	X	X	
86. Power Down Gunner Station (9 Tasks)	D		X	X			X			X	X	X					X		
87. Exit Tank	S																X		
XXIV. PERFORM PRE-FIRE PMCSs (REPEAT PRE-OP TASKS #22-37, 50, 52, 53, 54, 71)	DFRNT	NO	YES	YES	POS	NO	YES	NO	POS	YES	YES	YES	YES	YES	1	X	YES	YES	
88. Check Coax Machinegun Mounting	D	X															X		
89. Check Coax Electric Solenoid	S																X		
90. Check Coax Manual Trigger	S																X		
91. Check Coax Manual Safety	S																X		
92. Check Boresight (4 Tasks)	U			X	?		X	?	?	X	X		X				X		
XXV. PERFORM PREPARE-TO-FIRE CHECKS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	YES	1	X	YES	?	NO
93. Prepare To Fire Main Gun	D		X	X			X	?		X	X		X						
a. Normal	(d)		(x)	(x)			(x)	(?)		(x)	(x)		(x)						
b. Degraded	(d)		(x)	(x)			(x)	(?)		(x)	(x)		(x)						
94. Prepare To Fire Coax	D		X	X			X	?		X	X		X						
a. Normal	(d)		(x)	(x)			(x)	(?)		(x)	(x)		(x)						
b. Degraded	(d)		(x)	(x)			(x)	(?)		(x)	(x)		(x)						
XXVI. TARGET ACQUISITION	DFRNT	YES	NO	YES	POS	NO	YES	YES	POS	YES	YES	NO	YES	NO	?	?	?	YES	?
95. Acquire Targets Using GPS	D	X		X			X	?		X	X		X						
96. Acquire Targets Using TIS	D	X		X			X	?		X	X		X					X	
97. Acquire Targets Using CAS	S			X			X	?		X	X		X						

XMI TASK LIST (GUNNER)	MOOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-AL, TY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
98. Acquire Targets Using Unity Window	S			X			X	?		X	X		X						
99. Acquire Targets During Day	D	X		X			X	?		X	X		X						
100. Acquire Targets During Night	D	X		X			X	?		X	X		X						
101. Acquire Targets From Defilade	S			X			X	?		X	X		X						
102. Acquire Targets While Stationary	S			X			X	?		X	X		X						
103. Acquire Targets While Moving	D		X	X	?		X	?	?	X	X		X						
104. Hand-Off Acquired Targets	S	X								X	X		X						
XXVII. TARGET ENGAGEMENTS WITH MAIN GUN (NORMAL) (GPS)	DFRNT	YES	NO	YES	POS	YES	YES	YES	POS	YES	YES	NO	YES	YES	1	X	YES	YES	NO
105. Set Weapon System Operating Specifications For Normal Mode	D																X		
a. Set Magnification	(u)																		
b. Set Fire Control Mode	(u)																(x)		
c. Set Gun Select	(d)																(x)		
d. Set Ammo Select	(d)																(x)		
e. Set LRF To Designated Mode	(u)																(x)		
106. Acquire Target And Identify	D/T	D	U	X			X			X	X		X				X	?	
a. Announce "Cannot Identify"	(s)																		
b. Announce "Identified"	(s)																(x)	(x)	
c. Take Up Turret Control From TC	(d/u)	(d)	(u)	(x)		(x)				(x)	(x)		(x)					(x)	

	OMI TASK LIST (CONTINUED)	MSOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA				
		COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OUT	TRAINING SITE TRANS	TRAINING SITE UNIT
	Lay On Target (GPS):																		
107.	Stat/Stat	S	X															X	X*	
108.	Stat/Moving (Track)	S	X		X	?	X		?	?	X	X		X						
109.	Moving/Stat (Track)	U			X	?	X		?	?	X	X		X					X	
110.	Moving/Moving (Track)	U			X	?	X		?	?	X	X		X					X	
111.	Determine Range To Target Using LRF and GPS (Lase On Center of Mass)	U	X	X	X		X		?		X	X		X				X	X	
112.	Verify Firing Status	U			X	?		X	?	?	X	X		X				X	X	
	a. Check/Respond To Multiple Return	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)				(x)	(x)	
	b. Check/Respond To Fault Symbol	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)				(x)		
113.	Fire Main Gun	S																X	X	
114.	Respond to Main Gun Misfire	S			X			X			X	X		X				X	X*	
	Round Sense (GPS):																			
115.	Stat/Stat	D	X															X		
116.	Stat/Moving (Track)	D	X		X			X	?		X	X		X						
117.	Moving/Stat (Track)	U			X	?	X	X	?	?	X	X		X						
118.	Moving/Moving (Track)	U			X	?	X	X	?	?	X	X		X						
	Adjust Fire (GPS):																			
119.	Apply Re-Engage Method	U			X	?	X	X	?	?	X	X		X				X	X	
120.	Apply BOT	S/U	S	U	X	?	X	X	?	?	X	X		X						
121.	Apply Standard Range Correction	S/U	S	U	X	?	X	X	?	?	X	X		X					X*	
122.	Re-Fire (TC Toggle Range Adj.)	U			X	?	X	X	?	?	X	X		X						
123.	Respond To Subsequent Fire Command	S/U	S	U	X	?	X	X	?	?	X	X		X					X*	

XM1 TASK LIST (GUNNER)	MSOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HQ	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXVIII. TARGET ENGAGEMENT WITH MAIN GUN (NORMAL/EMERGENCY) (TIS)	UNIQUE	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	?	?	?	?	NO	?
Lay On Target (TIS):																			
124. Stat/Stat	U			X			X	?		X	X		X						
125. Stat/Moving (Track)	U			X		X	X	?		X	X		X						
126. Moving/Stat (Track)	U			X	?	X	X	?	?	X	X		X						
127. Moving/Moving (Track)	U			X	?	X	X	?	?	X	X		X						
128. Determine Range to Target Using LRF/TIS (Lase on Center of Mass	U			X			X	?		X	X		X						
Round Sense (TIS):																			
129. Stat/Stat	U			X			X	?		X	X		X						
130. Stat/Moving (Track)	U			X		X	X	?		X	X		X						
131. Brief Halt	U			X			X	?		X	X		X						
132. Moving/Stat (Track)	U			X	?	X	X	?	?	X	X		X						
133. Moving/Moving (Track)	U			X	?	X	X	?	?	X	X		X						
Adjust Fire (TIS):																			
134. Apply Re-Engage Method	U			X		X	X	?		X	X		X						
135. Apply BOT	U			X	?	X	X	?	?	X	X		X						
136. Apply Standard Range Computation	U			X	?	X	X	?	?	X	X		X						
137. Re-Fire (TC Toggle Range Adj.)	U			X	?	X	X	?	?	X	X		X						
138. Respond to Subsequent Fire Command	U			X	?	X	X	?	?	X	X		X						
XXIX. TARGET ENGAGEMENTS WITH MAIN GUN (EMERGENCY) (GPS)	DFRNT	YES	NO	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	?	?	?	?	?	?

XM1 TASK LIST (GUNNER)	MOAL TASK COMPARISON ANALYSIS									TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE		SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
139. Set Weapon System Operating Specifications For Emergency Mode	D	X																X		
a. Set Fire Control Mode	(u)																	(x)		
b. Set Gun Select	(d)	(x)																		
140. Lay On Target From A Brief Halt	S/U	S	U	X		X					X	X		X						
141. Apply Manual Lead For Moving Targets Using GPS Reticle	S/U	S	U	X	?	X	X	?		?	X	X		X						
XXX. TARGET ENGAGEMENTS WITH MAIN GUN (MANUAL) (GAS)	DFRNT	YES	NO	YES	POS	YES	YES	POS		POS	YES	YES	NO	YES	?	?	?	?	?	?
142. Set Weapon System Operating Specifications For Manual Mode	D																	X		
a. Set Fire Control Mode	(u)																	(x)		
b. Set GAS To ON	(u)																			
c. Set Filter (IN/OUT)	(d)																			
d. Set APDS/HEP Or HEAT Reticle	(d)																	(x)		
143. Traverse To Announced Target Location	S	X		X		X					X	X		X				X		
144. Lay On Target Using Announced Rangeline	S	X		X	?	X	X	?		?	X	X		X				X	X	
145. Apply Manual Lead For Moving Targets Using CAS Reticles	S			X	?	X	X	?		?	X	X		X						
146. Manually Traverse And Elevate Simultaneously While Tracking A Moving Target	S	X		X	?	X	X	?		?	X			X						
Fire Main Gun:																				
147. Using Trigger On Manual Elevation Handle	S																	X		
148. Using Blasting Machine	S																	X		
149. Respond To Main Gun Misfire	S			X			X	?			X	X		X				X		

XM1 TASK LIST (GUNNER)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
150. Relay On Target Using Manual Controls	S	X		X		X	X	?		X	X		X				X		
Adjust Fire:																			
151. Apply BOT Using Manual Controls/GAS	S	X		X		X	X	?		X	X		X						
152. Apply Standard Range Correction Using Manual Controls/GAS	S	X		X		X	X	?		X	X		X						
153. Respond to Subsequent Fire Command Using Manual Controls/GAS	S	X		X		X	X	?		X	X		X					X*	
XXXI. MAIN GUN TARGET ENGAGEMENTS USING BATTLESIGHT GUNNERY	DFRNT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	?	?	?	?	?	?
154. Apply Battlesight Gunnery	S/U	S	U	X	?	X	X	?	?	X	X		X					X	
155. Modify Battlesight Aim	S/U	S	U	X	?	X	X	?	?	X	X		X						
156. Adjust Fire Using Target Form	S/U	S	U	X	?	X	X	?	?	X	X		X						
XXXII. TARGET ENGAGEMENT USING RANGE CARD	DFRNT	NO	NO	YES	NO	NA	YES	NO	NO	YES	YES	YES	YES	NO			?	NO	?
157. Prepare Range Card	D			X			X			X	X	X		X	3	Z			
158. Respond To Range Card Fire Commands	D			X			X			X	X	X	X						
XXXIII. RESPOND TO SPECIFIC FAILURES	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES	NO	?	?	?	NO	?
159. Respond To GPS Failure	D	X																	
a. Use TIS	(u)																		
b. Use GAS	(d)	(x)																	
160. Respond To TIS Failure	U																		
a. Use GPS	(u)																		
b. Use GAS	(d)																		

XM. TASK LIST (GUNNER)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
161. Respond To Laser Range-finder Failure (May Get An Aberrant Range Or None)	U		y	X	?	X	X	?	?	X	X	X	X					X	
a. Determine Failure ("H" Displayed)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)	(x)						
b. Cancel Input	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
c. Determine Range Using Non-Ballistic Reticle and Index Into Computer	(s/u)	(s)	(u)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)					(x)	
d. Index Announced Range Into Computer	(d)		(x)	(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)					(x)	
e. Use Battlesight Gunnery	(s/u)	(s)	(u)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
162. Respond To Crosswind Sensor Failure	U			X	?	X	X	?	?	X	X	X	X						
a. Determine Failure ("3" Displayed)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)	(x)						
b. Cancel Input	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
c. Apply Aim-Off When Using HEAT Or HEP	(s/u)	(s)	(u)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
163. Respond To Cant Sensor Failure	U			X	?	X	X	?	?	X	X	X	X						
a. Determine Failure ("2" Displayed)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)	(x)						
b. Cancel Input	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						
c. Move Vehicle To Level Or Aim High In Opposite Direction	(s/u)	(s)	(u)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
164. Respond To Lead Angle Sensor Failure (Incorrect Or Inoperative)	U			X	?	X	X	?	?	X	X	X	X						
a. Determine Failure ("4" Displayed)	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)	(x)	(x)						
b. Cancel Input	(u)			(x)	(?)		(x)	(?)	(?)	(x)	(x)		(x)						

XM1 TASK LIST (GUNNER)	MEOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
c. Apply Manual Lead Based On Ammo/Speed	(s/u)	(s)	(u)	(x)	(?)	(x)	(x)	(?)	(?)	(x)	(x)		(x)						
165. Respond To Combined Failures	U			X	?	X	X	?	(?)	X	X	X	X						
XXXIV. TARGET ENGAGEMENTS WITH COAX (NORMAL OR EMERGENCY) (GPS)	DFRNT	YES	NO	YES	NO	YES	YES	NO	NO	YES	YES	NO	YES	YES	1	X	YES	NO	NO
166. Lay On Target	S/U	S/U															X		
167. Determine Range to Target Using LRF/GPS (Lase at Base of Target)	U																		
168. Fire 25-30 Round Bursts	S/U	S/U															X		
169. Adjust Coax Fire (GPS)	D/U	D/U															X		
a. Apply Walk-In Technique	(d/u)	(d/u)																	
b. Apply Z-Pattern	(d/u)	(d/u)																	
c. Apply Turret Carry	(d/u)	(d)	(u)	(x)		(x)				X	X		X						
XXXV. TARGET ENGAGEMENTS WITH COAX (NORMAL/EMER) (TIS)	UNIQUE	YES	NO	YES	NO	NA	NA	NO	NO	YES	YES	NO	YES	?	?	?	?	NO	?
170. Determine Range to Target Using LRF/TIS (Lase on Target Base)	U			X			X			X	X		X						
171. Adjust Coax Fire (TIS)	U																		
a. Apply Walk-In Technique	(u)																		
b. Apply Z-Pattern	(u)																		
c. Apply Turret Carry	(u)																		
XXXVI. TARGET ENGAGEMENTS WITH COAX (MANUAL) (GAS)	SAME	NO	NO	YES	NO	YES	YES	NO	NO	YES	YES	NO	YES	?	?	?	?	NO	?
172. Lay On Target Using Manual Controls/GAS	S			X		X				X	X		X						
Determine Range-To-Target:																			
173. Estimate Range to Coax Target	S			X			X			X	X		X						

AMI TASK LIST (GUNNER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE DSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
174. Select Battlesight Range (HEP)	S			X			X			X	X		X						
Fire Coax In 25-30 Round Bursts:																			
175. Using Firing Trigger On Manual Elevation Handle	S																		
176. Using Firing Trigger On Coax Machinegun	S			X		X				X	X								
177. Adjust Coax Fire (GAS):	S			X		X	X			X	X		X						
a. Apply Walk-In Technique	(s)			(x)		(x)	(x)			(x)	(x)		(x)						
b. Apply Z-Pattern	(s)			(x)		(x)	(x)			(x)	(x)		(x)						
c. Apply Turret Carry	(s)			(x)		(x)	(x)			(x)	(x)		(x)						
XXXVII. ENGAGE MULTIPLE/SIMULTANEOUS TARGETS	DFRNT	NO	NO	YES	POS	YES	YES	NO	POS	YES	YES	NO	YES	NO	?	?	NO	NO	?
178. Respond to Multiple Target Fire Commands	S/U	S	U	X	?	X	X		?	X	X		X						
179. Dump Automatic Lead	U			X			X			X	X		X						
180. Respond to Simultaneous Fire Commands	S/U	S	U	X	?	X	X		?	X	X		X						
XXXVIII. TROUBLESHOOT TURRET	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES	YES	1	X	YES	NO	?
181. Gunner Indicator Lights (7)	?		?	X	?		X	?	?	X	X	X	X						
a. Fire Control Mode Lights (3)	(d)			(x)			(x)			(x)	(x)	(x)	(x)						
b. Ammunition Select Light	(d)			(x)			(x)			(x)	(x)	(x)	(x)						
c. Gun Select Lights (3)	(d)			(x)			(x)			(x)	(x)	(x)	(x)						
182. Fire Control System (24)	D		X	X	?		X	?	?	X	X	X	X	YES	1	X	X		NO
a. Main Gun Rounds Fall Short Target	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		

XXI TASK LIST (CUMMER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA				
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MODE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRADE	TRAINING SITE UNIT
b. No Reticle in GPS	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
c. GPS Panel Lights Test Fails	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
d. GPS Fails to Work	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
e. GPS Reticle Drifts Off Target	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
f. "P" Symbol Appears in GPS	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
g. TIS Fails From Stand-by to ON	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
h. No Thermal Image	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
i. TIS Fails to Work	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
j. Unable to Lase	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
k. No Reticle in GAS	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
l. Computer Fails (1)	(d)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
m. Cant Sensor Fails(2)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
n. Crosswind Sensor Fails (3)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
o. Lead Rate Fails (4)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
p. Elevation Rate Fails (5)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
q. Data Link Fails (7)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
r. LRF Fails (8)	(u)			(x)			(x)			(x)	(x)	(x)	(x)				(x)		
s. Main Gun Fails to Elevate - NORMAL or EMERGENCY	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
t. Turret Fails to Traverse - NORMAL or EMERGENCY	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
u. Both s and t	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
v. Turret Jerks When Traversing in POWER	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		

XM1 TASK LIST (GUNNER)	MISAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	HOME NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE DEBT	TRAINING SITE TRANS	TRAINING SITE UNIT
w. Turret Fails to Traverse-Manual	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
x. Main Gun Fails to Elevate/Depress-Manual	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
y. Unable to Fire Using GNR's Control Handle	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)		
183. Coaxial Machinegun (1)	S			X		X	X	?		X	X	X	X						
a. Fails to Fire	(s)			(x)		(x)	(x)			(x)	(x)	(x)	(x)						
184. Auxiliary Systems	S			X			X			X	X	X	X				X		
a. GNR's Gas Particulate Heater Fails to Heat	(s)			(x)			(x)			(x)	(x)			(x)	1	(x)	(x)		
XXXIX. PERFORM DURING-FIRE PMCS (TASK #62, as needed)	DFRNT	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	1	X	YES	NO	NO
185. Check Coax Operation	S			X			X			X	X			X	1	X	X		
XXXX. PERFORM AFTER-FIRE PMCS (TASKS #10, 22-37, 50, 52, 53, 54, 71)	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	NO	NO	YES	1	X	YES	YES	NO
186. Check GAS Mounting	D			X		X				X	X						X		
187. Field Strip and Check Coax Parts	S							?						X	1	X	X		
188. Clean and Lubricate Coax	S													X	1	X	X		
XXXXI. LUBRICATE XM1 ACCORDING TO LUBRICATION ORDER (LO)	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	YES	NO	YES	1	2	NO	NO	?

TABLE III

XM1 TASK LIST

(LOADER)

XM1 TASK LIST (LOADER)	NOMAT TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM REDESIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HQ	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
I. PERFORM BEFORE OPERATION PMCS (EXTERIOR)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
1. Check Vehicle Exterior	D																X		
2. Check Sponson Equipment Stowage For Completeness	D			X			X			X	X	X							
3. Check Exterior Turret Stowage	D			X			X			X	X	X						X	
4. Clean Loader Exterior Optics	U													X	1	X	X	X	
5. Erect/Service Crosswind Sensor	U																X	X	
6. Install Loader's M240 Machinegun	U			X		X	X			X	X			X	1	X	X	X	
II. PREPARE LOADER'S STATION FOR OPERATIONS (TASKS #7-16)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
7. Open Loader's Hatch (Outside)	D																X	X	
a. Unlock/Stow Lock	(a)																(x)	(x)	
b. Raise Ldr's Hatch To Locked Position	(d)																(x)	(x)	
8. Enter Loader's Station	D																X	X	
9. Operate Domelight	D																X	X	
a. Select Filters (Red/White)	(d)																(x)		
b. Turn ON/OFF	(d)																(x)	(x)	
c. Adjust Brightness	(d)																(x)		
10. Power Up Loader's Station	U			X			X			X	X	X					X		
a. Check Turret Power Light ON	(u)																(x)		

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION:		TRAINING			TRAINING DELIVERY DATA				
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OUT	TRAINING SITE TRANS	TRAINING SITE UNIT
b. Check Main Gun Status Safe Light ON	(u)																(x)		
c. Check Turret Blower Is OFF	(u)																(x)		
d. Check Gun Turret Drive Manual Light ON	(u)																(x)		
11. Operate Radio Set With Intercom System	S			X			X			X	X	X	X				X	X	
a. Connect/Disconnect CVC Helmet To Intercom	(s)													(x)	1	(x)	(x)		
b. Turn Amplifier ON/ OFF	(s)																(x)	(x)	
c. Intercom Without Remote Control	(s)																(x)		
12. Adjust Loader's Seat and Platform	D																X	X	
a. Raise/Lower Ldr's Seat	(d)																(x)	(x)	
b. Raise/Lower Ldr's Platform	(d)																(x)	(x)	
13. Operate Loader's Hatch From Inside Tank	D																X	X	
a. Open/Close Ldr's Hatch (Inside)	(d)																(x)		
b. Lock/Unlock Ldr's Hatch (Inside)	(d)																(x)	(x)	
14. Install Loader's Periscopes	D			X		X	X										X	X	
a. Install Ldr's Day Periscope	(d)																		
b. Install Dvr/Ldr's Night Vision Viewer	(d)																		
c. Operate Night Vision Viewer (AN/VVS2)	(s)			(x)			(x)			(x)	(x)			(x)	1	(x)	(x)	(x)	

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
15. Install Loader's Guards For Firing	U																?		
16. Position Loader's Guards/Seat Belt For Firing	U																X	X	
III. PERFORM BEFORE OPERATIONS PMCS (INTERIOR)	DFRNT	NO	YES	NO	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
17. Check Hydraulic System Oil Reservoir	D	X	X	X			X			X	X						X	X	
a. Check Hydraulic Reservoir Oil Level	(d)	(x)															(x)	(x)	
b. Check For Hydraulic Leaks	(d)		(x)	(x)			(x)			(x)	(x)	(x)					(x)	(x)	
c. Check Filter Bypass Buttons	(u)																(x)	(x)	
IV. OPERATE FIRE CONTROL EQUIPMENT	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	NO	NO	YES	1	X	YES	YES	NO
Operate Main Gun Elevation Travel Lock:																			
18. Unlock/Stow Travel Lock	D	X															X	X	
19. Lock Travel Lock	D	X															X	X	
Operate Turret Traverse Lock:																			
20. Unlock Turret Traverse Lock	S																X	X	
21. Lock Turret Traverse Lock	S																X	X	
Operate Main Gun Breech:																			
22. Open Main Gun Breech Manually	S																X	X	
23. Close Main Gun Breech Manually	S																X	X	

XM1 TASK LIST (LOADER)	MEOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	DIMENSIONALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
Operate Main Gun:																			
24. Load Main Gun	D		X	X		X	X	?		X	X			X	1	X	X	X*	
25. Unload Main Gun	D			X		X	X	?		X	X			X	1	X	X	X*	
26. Perform Main Gun Manual Round Extraction	S			X		X	X			X	X			X	1	Y			X
Operate Coaxial Machinegun:																			
27. Load M240 Coax Machinegun Ready Ammunition Box	D																X	X	
28. Clear M240 Coax Machinegun	D			X	?		X	?		X	X						X		
29. Unload M240 Coax Machinegun	D																		
Operate Loader's Machinegun:																			
30. Load M240 Machinegun	D																?		
31. Fire M240 Machinegun	D																X		
32. Change M240 Machinegun Barrel	D																		
33. Clear M240 Machinegun	D			X	?		X	?		X	X			X	1	X	X		
Operate M250 Grenade Launcher:																			
34. Load M250 Grenade Launcher	S													X	1	X	X	X	
35. Unload M250 Grenade Launcher	S													X	1	X	X	X	
V. STOW MAIN GUN AMMO	DPRNT	NO	YES	YES	NO	YES	NO	NO		X	X			YES	1	X	YES	YES	NO
Operate Ready Ammunition Compartment Door:																			
36. Open/Close Ready Door Automatically	U			X		X				X	X		X				X	X	

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
37. Open/Close Ready Door Manually	U			X		X				X	X		X				X	X	
Operate Semi-Ready Ammunition Compartment Door:																			
38. Open Semi-Ready Door Manually	U			X		X				X	X		X				X	X	
39. Close Semi-Ready Door Manually	U			X		X				X	X		X				X	X	
Operate Hull Ammunition Compartment Door:																			
40. Open Hull Ammo Door Manually	U			X		X				X	X		X				X	X	
41. Close Hull Ammo Door Manually	U			X		X				X	X		X				X	X	
Stow/Unstow Ammo:																			
42. Inspect Ammo and Prepare It For Stowage	S													X	1	Y	?		
43. Stow Ammo In Hull Stowage Racks	D			X		X				X	X						X	X	
44. Stow Ammo In Ready Ammunition Compartment	D																X	X	
45. Stow Rounds in Semi-Ready Ammunition Compartment	U			X		X				X	X						X	X	
46. Stow In Turret Floor Ready Racks	D																X	X	
47. Remove Stowed Round From Ready Rack	D																X	X	
VI. OPERATE COMMUNICATION SYSTEM	SAME	NO	NO	YES	POS	YES	YES	POS	POS	YES	YES	NO	NO	YES	1	X	NO	NO	?
48. Install/Remove Radio Set	D			X		X				X	X			X	1	X			
49. Operate Amplifier (AM 1780/VRC)	S			X			X	?	X	X	X			X	1	X			
50. Operate Frequency Selector Control (C-2742/VRC)	S			X			X		X	X	X			X	1	X			

XM1 TASK LIST (LOADER)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CONDITION-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
51. Operate Receiver/Transmitter (RT-246/VRC)	S			X			X		X	X	X			X	1	X			
52. Operate Auxiliary Receiver (R-442/VRC)	S			X			X		X	X	X			X	1	X			
53. Operate Receiver/Transmitter (AN/VRC-64)	S			X			X		X	X	X			X	1	X			
54. Install/Remove Antennas	S			X			X							X	1	X	X		
a. Transmitter Antenna	(s)			(x)			(x)							(x)	(1)	(x)	(x)		
b. Receiver Antenna	(s)			(x)			(x)							(x)	(1)	(x)	(x)		
55. Stow/Unstow Antennas	D													X	1	X	X		
56. Tie-Down Antennas	D			X			X					X		X	1	X			
57. Preset Tactical Radios	S			X			X					X		X	1	Z			
58. Maintain Radio Set	S			X			X					X		X	1	X			
VII. OPERATE GAS PARTICULATE FILTER SYSTEM	SAME	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	Y&S	1	X	YES	YES	NO
59. Stow/Unstow Protective Mask (M24)	S																		
60. Clear and Seal Mask	S													X	1	X			
61. Check Filter, Hose and Connectors	S													X	1	X		X	
62. Check Intercom Connection	S																		
63. Check Heater Lamp Light	S																	X	
64. Adjust Heater Temperature	S																	X	
VIII. OPERATE FIRE EXTINGUISHERS	OPRNT	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
65. Operate External Fire Extinguisher Handle	S																		
66. Operate Portable Fire Extinguisher	S																		

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
67. Check Pressure Gauges (Reference Ambient Temperature) and Secure Mounts	U																		
68. Maintain Fire Sensor Lenses	U																X		
IX. OPERATE CB/UTILITY OUTLET CONTROLS	UNIQUE	NA	NA	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	?	?	NO	YES	?
69. Operate Turret Networks Box	U																	X	
a. Open/Close Networks Door	(u)																	(x)	
b. Turn ON/OFF CBs	(u)																	(x)	
c. Reset CB	(u)																	(x)	
70. Operate Utility Outlet/ Hot Cup	U																	X	
a. Remove Utility Cap	(u)																	(x)	
b. Install/Operate/ Remove Hot Cup	(u)																	(x)	
c. Install Utility Cap	(u)																	(x)	
X. PREPARE WEAPONS FOR TRAVEL	DIFFRNT	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	X	1	X	YES	NO	NO
71. Prepare Main Gun for Travel	D	X															X		
a. Clear Main Gun	(d)	(x)															(x)		
b. Lock Elevation Lock	(d)	(x)															(x)		
c. Set GUN SELECT Switch to SAFE	(d)	(x)															(x)		
72. Prepare M240 Coax Machinegun for Travel	D																X		
a. Clear Coax Machinegun	(d)																(x)		
b. Remove Ammunition Belt	(d)																(x)		
c. Stow Ammunition Belt	(d)																(x)		

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASS...	CAUSE ...OR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
73. Prepare Loader's Machinegun for Travel	U																X		
a. Clear Loader's Machinegun	(u)													(x)	1	(x)	(x)		
b. Stow Ammunition	(u)																(x)		
c. Point Machinegun Toward Front of Tank	(u)																(x)		
d. Lock Skate Ring Lock	(u)																(x)		
e. Lock Azimuth Lock	(u)																(x)		
f. Lock Elevation Lock Pin	(u)																(x)		
74. Prepare M250 Grenade Launcher for Travel	D																X		
a. Unlock M250 Grenade Launchers	(d)																(x)		
b. Install M250 Grenade Launcher Covers	(d)																(x)		
XI. PERFORM "DURING" OPERATION PMCS (REPEAT TASK #1)	DFRNT	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	1	X	YES	NO	NO
XII. POWER DOWN AND SECURE STATION	DFRNT	NO	YES	YES	NO	YES	NO	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
75. Remove/Stow Loader Firing Guards	U																X		
76. Remove Night Vision Viewer	D			X		X				X	X						X	X	
77. Remove/Stow Loader's Day Periscope	D			X		X				X	X						X	X	
78. Remove Loader's M240 Machinegun	U			X		X				X	X			X	1	X	X	X	
79. Power Down Loader's Station	D																X		
80. Exit Tank	S																X		

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
81. Close and Lock Loader's Hatch	D																	X	
82. Service/Stow Crosswind Sensor	U			X		X				X	X						X	X	
XIII. PERFORM AFTER OPERATION PMCS (REPEAT TASK #17)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
83. Check Loader's Panel Operation	U			X			X			X	X							X	
XIV. PERFORM PRE-FIRE PMCS (REPEAT TASK #17)	UNIQUE	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
84. Check Remote Thermometer	U																		
85. Check 105mm Main Gun Tube	S																X		
86. Check Main Gun Breech Group	S													X	1	X	X		
87. Check Main Gun Mount	S			X		X				X	X						X		
88. Check Firing Circuits and Triggers	D		X	X			X	?		X	X						X	X*	
89. Check Loader's M240 Machinegun	U			X		X		?									X		
XV. PERFORM PREPARE TO FIRE CHECKS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	YES	YES	1	X	YES	YES	NO
90. Prepare For Main Gun Firing	D		X	X			X			X	X	X	X						
91. Prepare For M240 Coax Machinegun Firing	D		X	X			X			X	X								
92. Prepare For Cal .50 Machinegun Firing	D			X			X			X	X								
93. Prepare For Loader's M240 Machinegun Firing	U			X			X			X	X								
XVI. TARGET ACQUISITION	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	NO	NO	NO			NO	NO	NO
94. Acquire Targets Using Loader's Day Periscope	?			X	?		X		?	X	X		X						

XVI TASK LIST (LOADER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MDRE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
95. Acquire Targets Using Driver/Loader's Night Vision Viewer	U			X	?		X		?	X	X		X						
96. Acquire Targets From Open Hatch With Naked Eye	S			X	?		X		?	X	X		X						
97. Acquire Targets From Hull/Turret Defilade	S			X	?		X		?	X	X		X						
98. Acquire Targets While Stationary	S			X	?		X		?	X	X		X						
99. Acquire Targets While Moving	U			X	?		X		?	X	X		X						
100. Hand-Off Acquired Targets	S									X	X		X						
XVII. TARGET ENGAGEMENT WITH MAIN GUN	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	NO	YES	YES	1	X	YES	YES	NO
101. Activate Turret Blower	D																X	X	
102. Arm The Main Gun	D		X	X			X			X	X		X					X	
a. Switch To POWERED	(u)			(x)			(x)			(x)	(x)		(x)				(x)		
b. Move Ejection Guard To Rear	(u)			(x)			(x)			(x)	(x)		(x)				(x)		
c. Announce "UP"	(s)																(x)		
103. Safe The Main Gun	D		X	X			X			X	X		X				X		
a. Switch To EL UNCPL	(u)						(x)			(x)	(x)		(x)				(x)		
b. Move Ejection Guard To Front	(u)									(x)	(x)		(x)				(x)		
104. Respond to Main Gun Misfire	S			X		X	X			X	X	X	X					X*	
105. Respond To Main Gun "Cease Fire"	S																X		
a. Reload Battlesight Round	(s)			(x)		(x)				(x)	(x)								

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
b. Reload Round Designated By Commander	(s)			(x)		(x)				(x)	(x)								
XVIII. TARGET ENGAGEMENT WITH COAXIAL MACHINEGUN	OFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	NO	NO	YES	1	X	YES	YES	NO
106. Arm The M240 Coax Machinegun	U			X			X			X	X								
a. Switch To POWERED	(c)			(x)			(x)	?		(x)	(x)								
b. Place M240 Coax Safety In 'F'	(s)																		
107. Round Sense Coax Fire	D			X			X			X	X								
108. Respond To Coax "Cease Fire"	D																		
a. Reload M240 Coax Machinegun	(d)																		
b. Remove Spent Cartridges From Container	(u)																		
XIX. TARGET ENGAGEMENT WITH M240 LOADER'S MACHINEGUN	UNIQUE	NA	NA	YES	POS	YES	YES	POS	NO	YES	YES	NO	YES	YES	1	X	YES	?	NO
109. Arm The Loader's M240 Machinegun (Place M240 Ldr's Machinegun Safety in 'F')	U																X		
110. Acquire Target and Identify	U			X			X	?		X	X		X				X		
a. Announce "CANNOT Identify"	(u)																		
b. Announce "Identified"	(u)																		
Lay On Target:																			
111. Stat/Stat	U																X		
112. Stat/Moving (Track)	U			X		X	X	?		X	X		X						

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
113. Moving/Stat (Track)	U			X		X	X	?		X	X		X						
114. Moving/Moving (Track)	U			X		X	X	?		X	X		X						
115. Estimate Range To Target	U			X		X	X	?		X	X		X				X		
116. Fire M240 In 25-30 Round Bursts	U																X		
117. Apply Immediate Action to M240 Ldr's MG	U			X		X	X			X	X		X				X	X*	
a. Respond to M240 Fail-To-Fire	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)				(x)		
b. Respond To M240 Runaway Gun	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
Round Sense:																			
118. Stat/Stat	U																X		
119. Stat/Moving	U			X		X				X	X		X						
120. Moving/Stat	U			X		X				X	X		X						
121. Moving/Moving	U			X		X				X	X		X						
122. Adjust M240 Ldr's MG Fire	U			X		X	X	?		X	X		X				X		
a. Apply Walk-In Technique	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
b. Apply Z-Pattern	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
c. Apply Turret Carry Method (Gunner)	(u)			(x)		(x)	(x)	?		(x)	(x)		(x)						
XX. PERFORM DURING-FIRE PMCS (REPEAT TASKS #17, 87, 89)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	Z	YES	YES	NO
XXI. PERFORM AFTER-FIRE PMCS (REPEAT TASKS #82, 85-88, 123, 124)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
Ammo:																			
123. Check Operation Of Bustle Doors, Ready Door Knee Switch, Door Edge Safety Switch	U			X		X				X	X						X		

XM1 TASK LIST (LOADER)	MEOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE DSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
124. Check Ammo Retaining Spring Clips	U																X		
125. Check Turret Ammo Stowage and Accountability	D			X			X							X	1	X	X		
126. Check Coax Ready Ammo Belt	D																X		
127. Check Operation Of Hull Ammo Door and Stowage	U			X		X				X	X						X		
Main Gun:								•											
128. Check And Clean Bore Evacuator	S																X		
129. Clean And Lubricate Main Gun Breech Group	S			X		X				X	X			X	1	X	X	X*	
130. Remove Oil From Residue Collector	U																X		
M240 Machinegun:																			
131. Field Strip And Check M240 Machinegun	S			X		X				X	X			X	1	X	X		
132. Clean And Lubricate M240 Machinegun	S													X	1	X	X		
XXII. EMERGENCY MAIN GUN OPERATIONS	SAME	NO	NO	YES	NO	YES	YES	NO	NO	YES	YES	NO	NO	NO			NO	NO	NO
133. Operate Main Gun - Adjust For Cold Weather	S																		
134. Close 105mm Main Gun Breech Under Emergency Procedure	S			X		X	X			X	X								
XXIII. TROUBLESHOOT TURRET	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES	YES	1	X	YES	NO	NO
135. Loader's Indicator Panel (6 Tasks)	U			X	?		X		?	X	X	X	X	X	1	X			
a. Loader's Panel Lights	(u)			(x)	(?)		(x)		(?)	(x)	(x)	(x)	(x)						

XM1 TASK LIST (LOADER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE DSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
b. Spent Case Ejection Guard (Control) Lights (2)	(u)			(x)	(?)		(x)		(?)	(x)	(x)	(x)	(x)						
c. Gun Turret Drive Lights (3)	(u)			(x)	(?)		(x)		(?)	(x)	(x)	(x)	(x)						
136. Ammunition Compartments (6 Tasks)	U			X	?		X		?	X	X	X	X						
a. Ready Ammo Door Fails To Open Auto	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
b. Ready Ammo Door Fails To Close Auto	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
c. Ready Ammo Door Fails To Open Manually	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
d. Ready Ammo Door Fails To Close Manually	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
e. Semi-Ready Door Fails To Open	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
f. Semi-Ready Door Fails To Close	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)						
137. Auxiliary Systems (7 Tasks)	D		X	X	?		?		?	X	X	X	X						X
a. Turret Blower Fails	(d)			(x)	(?)		(x)		(?)	(x)	(x)			(x)	1	(z)			
b. Ldr Gas Particulate Heater Fails To Heat	(s)			(x)			(x)			(x)	(x)			(x)	1	(x)	(x)		
c. Night Vision Viewer Fails - Auto	(u)			(x)			(x)			(x)	(x)								
d. Night Vision Viewer Fails - Battery	(u)			(x)			(x)			(x)	(x)								
e. Turret Lock Fails To Lock	(s)			(x)			(x)			(x)	(x)								
f. Turret Lock Fails To Unlock	(s)			(x)			(x)			(x)	(x)								

XM1 TASK LIST (LOADER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HQ	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
g. Auxiliary Hydraulic Systems Fail	(u)			(x)	(?)		(x)		(?)	(x)	(x)	(x)	(x)						
138. Main Gun (4 Tasks)	S			X	?		X		?	X	X		X	X	1	X	X		
a. Breech Fails To Close	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
b. Breech Fails To Open Fully After Recoil	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
c. 105mm Gun Case Fails To Extract	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
d. 105mm Gun Return-To-Battery Is Excessive	(u)			(x)	(?)		(x)		(?)	(x)	(x)		(x)				(x)		
XXIV. LUBRICATE TANK ACCORDING TO LUBRICATION ORDER (LO)	DFRNT	YES	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	Z	NO	?	NO

TABLE IV

XM1 TASK LIST

(DRIVER)

XM1 TASK LIST (DRIVER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE NO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
I. PERFORM BEFORE OPERATION PMCS (EXTERIOR)	DFIONT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
1. Check Vehicle Exterior For Signs Of Leaks Tampering, Damage Or Unusual Conditions On Or Under Tank	D		X	X			X			X	X	X					X	X	
2. Check Track Tension and Adjust If Necessary	D			X		X	X			X	X						X	X	
3. Check Batteries	D																X	X	
4. Check Hull Access Plates	S																X	X	
5. Check Transmission Oil Level	S																X	X	
6. Check Engine Oil Level	S																X	X	
7. Check Front/Rear Fuel Tank Filler Covers and Seals	D																X	X	
8. Check Rear Grille Doors	D																X		
9. Check Sensor Cables and Clean All Engine Compartment Fire Extinguisher Sensor Lenses	U																X	X	
10. Check External Fire Exguisher Handle	S																	X	
11. Check Sponson Stowage	D			X			X			X	X	X						X	
12. Check Service Precleaner	U			X			X			X	X	X					X		
II. PREPARE DRIVER'S STATION FOR OPERATION	DYENT	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NG	NO	YES	1	X	YES	YES	NO
13. Enter Driver's Station	D																X	X	
a. Ensure Turret Is Locked	(s)																(x)	(x)	
b. Ensure Vehicle Master Power Switch On Control Panel Is Off	(s)																(x)	(x)	

XM1 TASK LIST (DRIVER)	360A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
c. Enter DR Station	(d)																(x)	(x)	
d. Ensure Parking Brake Is Set	(d)																(x)	(x)	
e. Ensure Crew Fire And Engine Fire Handles Are Seated	(d)																(x)	(x)	
III. PERFORM BEFORE OPERATION PMCS (INTERIOR)(TASKS #14-39)	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	1	X	YES	YES	NO
14. Check Parking Brake System Hydraulic Pressure	D	X															X	X	
IV. POWER UP HULL SYSTEMS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO
15. Check Driver's Master Panel	D			X			X			X	X	X					X	X	
a. Ensure DR's Master Panel Switches (8) Are OFF	(d)			(x)			(x)			(x)	(x)	(x)					(x)	(x)	
b. Ensure Fuel Tank Selector Switch Is In REAR	(u)																(x)	(x)*	
c. Ensure Fire Extinguisher Second Shot (Red) Cover Is Closed	(d)																(x)	(x)*	
d. Ensure All DR's Master Panel Gauges Show Lowest (Left) Position	(u)																(x)	(x)	
16. Check Hull Network and Hull Distribution Box	U																X		
a. Open Covers	(u)																(x)		
b. Ensure All Circuit Breakers Are ON	(u)																(x)	(x)*	
c. Close Covers	(u)																(x)		

XMI TASK LIST (DRIVER)	MOOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIX	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
17. Operate Domelight	D																X	X	
a. Select Domelight Filters (Red/White)	(d)																(x)		
b. Turn Domelight ON/OFF	(d)																(x)	(x)	
c. Adjust Domelight Brightness	(d)																(x)		
18. Energize Hull Electrical System	D		X	X			X	?		X	X		X				X	X	
a. Set And Hold Vehicle Master Power Switch To ON, Then Release	(d)																(x)	(x)*	
b. Ensure That Following Lights Are OFF:	(d)		(x)	(x)			(x)	?		(x)	(x)	(x)					(x)	(x)*	
(1) Personnel Heater																			
(2) Night Periscope																			
(3) Gas Particulate Filter																			
(4) Bilge Pump																			
(5) Smoke Generator																			
(6) Hi-Beam																			
c. Ensure That Parking/Service Brake Red Light Is ON	(d)																(x)	(x)	
19. Test/Adjust/Replace Panel Lights	U																X	X	
20. Adjust Alert Panel Light Brightness	D																X		
21. Adjust Master Panel Light Brightness	D																X	X	
22. Check Electrical System Gauge	D			X			X			X	X	X					X	X	

XM1 TASK LIST (DRIVER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
23. Check Maintenance Monitor Panel	U			X			X			X	X	X					X	X*	
a. Ensure CABLE DISCONNECTED Light Is OFF	(u)																(x)	(x)	
b. Ensure CIRCUIT BREAKER OPEN Light Is OFF	(u)																(x)	(x)	
24. Check Fuel Level	D		X	X			X	?		X	X	X						X*	
25. Operate Radio Set With Intercom System	D													X	1	X	X		
a. Connect/Disconnect CVC Helmet To Intercom	(s)													(x)	(1)	(x)	(x)		
b. Intercom Without Remote Control	(s)													(x)	(1)	(x)	(x)		
c. Intercom With Thumb Control Switch	(u)																		
26. Operate Driver's Hatch	D																X	X	
a. Unlock/Open DR's Hatch	(d)																(x)	(x)	
b. Lock DR's Hatch Open	(d)																	(x)	
27. Operate Driver's Seat	D																X	X	
a. Adjust DR's Seat For Closed Hatch Operation	(d)																(x)	(x)	
b. Raise/Lower DR's Seat For Open Hatch Operation	(d)																(x)	(x)	
28. Adjust Steer-Throttle Control	U																X	X	

XM1 TASK LIST (DRIVER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
29. Check Hull/Turret Seal and Pump	D																X	X	
a. Ensure Hull Turret Seal Pressure Gauge Is At Zero	(d)																(x)	(x)	
b. Inflate Turret Seal With Handpump	(d)																(x)	(x)	
c. Bleed Pressure From Hull/Turret	(d)																(x)	(x)	
30. Operate Drain Valves	D																X	X	
a. Open Drain Valves	(d)																(x)	(x)	
b. Close Drain Valves	(d)																(.)	(x)	
31. Adjust Driver's Day Periscopes	S																X	X	
32. Check Center Periscope Wiper/Washer and Fluid Level	U																X		
V. START ENGINE	DFRNT	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	1	X	YES	YES	NO
33. Perform Normal Start	D																X	X	
34. Perform Aborted Start	D			X			X			X		X	X				X	X	
VI. PERFORM AFTER-START CHECKS	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	YES	YES	1	X	YES	YES	NO
35. Check Engine Indicators	D		X	X			X	?		X		X	X				X	X	
36. Check Warning and Caution Lights	D		X	X			X	?		X		X	X				X	X	
a. Check Master Warning Light	(d)		(x)	(x)			(x)	(?)		(x)		(x)	(x)				(x)		
b. Check Maintenance Monitor Lights	(u)			(x)			(x)	(?)		(x)		(x)	(x)				(x)		
37. Check Main Accumulator Pressure	U			X			X			X	X	X	X				X		
38. Check Parking Brake System Hydraulic Pressure Gauge	D		X	X			X			X	X		X				X	X	

XII TASK LIST (DRIVER)	GOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
39. Transfer Fuel	D		X	X			X			X	X		X				X		
VII. OPERATE DRIVING CONTROLS	DFRNT	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO	YES	YES	1	X	YES	YES	NO
40. Operate Transmission Controls	D	X															X	X	
41. Operate Steer Controls	D/U	D	U	X			X			X	X		X					X	
42. Operate Brake Controls	D/U	D	U	X			X			X	X		X					X	
VIII. DRIVE TANK	DFRNT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	YES	1	X	YES	YES	NO
43. Move Tank	D/U	D	U	X			X	?		X	X		X				X		
44. Drive Tank Up And Down Hills	D/U		U	X	?	X	X	?	?	X	X		X				X	X	
45. Drive Tank Over Obstacles	D/U		U	X	?	X	X	?	?	X	X		X				X	X	
46. Drive Tank Across Ditch	D/U		U	X	?	X	X	?	?	X	X		X				X	X	
47. Drive Tank On Snow Or Ice	D/U		U	X	?	X	X	?	?	X	X		X				X		
48. Drive Tank In Extreme Dust, Sand Or Mud	D/U		U	X	?	X	X	?	?	X	X		X				X		
49. Drive Tank At High Speed	D/U		U	X	?	X	X	?	?	X	X		X				X		
a. Primary (Paved)	(d/u)	(x)		(x)		(x)		(?)		(x)	(x)		(x)						
b. Secondary (Dirt)	(d/u)	(x)		(x)		(x)		(?)		(x)	(x)		(x)						
c. Cross-country	(d/u)		(u)	(x)	(?)	(x)	(x)	(?)	(?)	(x)			(x)						
Drive Tank At Night:																			
50. Drive Tank Using Outside Lights	S/U		U	X	?	X	X	?	?	X	X		X					X	
51. Drive Tank Using Infrared Lenses	S/U		U	X	?	X	X	?	?	X	X		X					X	
52. Drive Tank Using Night Vision Viewer	S/U		U	X	?	X	X	?	?	X	X		X	X	1	X	X	X	

XM1 TASK LIST (DRIVER)	%60AI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA				
	CRITICALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HQ	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
Drive Tank Under NBC Conditions:																		
53. Drive Tank Wearing Protective Mask	S/P		P	X		X	X			X	X		X					
IX. FORD WATER OBSTACLES	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	NO	YES	NO		NO	NO	NO
54. Ford Tank in Shallow Water Obstacles	D			X			X			X	X		X					
55. Ford Tank in Deep Water Obstacle	D		X	X		X	X			X	X		X					
X. OPERATING TANK UNDER EXTREME WEATHER CONDITIONS	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO		NO	NO	NO
56. Operate Tank in Extreme Cold	D			X		X	X			X			X					
57. Operate Tank In Extreme Heat	D			X		X	X			X			X					
58. Operate Tank In Extreme Dust	D		X	X		X	X			X			X					
XI. OPERATE TANK UNDER EMERGENCY CONDITIONS	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	NO	NO	YES	NO		NO	YES	NO
59. Take Immediate Action To Loss of Engine Power	D		X	X			X	?		X			X				X*	
60. Take Immediate Action To Loss of Service Brake	D		X	X			X	?		X			X				X*	
61. Take Immediate Action To Stuck Parking Brake	D			X		X	X			X			X					
62. Take Immediate Action To Engine Failure To Shut Down	D		X	X			X	?		X			X					
63. Take Immediate Action To Loss of Steering	D		X	X		X	X	?		X			X				X*	
64. Take Immediate Action As Indicated By Driver's Instrument Panel	D			X			X	?		X			X				X*	

XM1 TASK LIST (DRIVER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
65. Perform Emergency Fuel Transfer	U			X			X			X	X								
66. Bypass Primary Fuel Filter	U			X			X			X	X								
XII. OPERATE FIRE EXTINGUISHERS	DFRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	YES	1	X	YES	YES	NO
67. Operate Engine Compartment - Automatic Mode	U																X	X	
68. Operate Engine Compartment - Manual Mode	D			X			X			X			X				X	X*	
69. Operate Crew Compartment - Automatic Mode	U																X	X	
70. Operate Crew Compartment - Manual Mode	D			X			X			X			X				X	X*	
71. Operate Portable Fire Extinguisher	S																		
XIII. OPERATE GAS PARTICULATE FILTER SYSTEM	SAME	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	1	X	YES	YES	NO
72. Clear and Seal Protective Mask (M25)	S													X	1	X	X		
73. Set GAS PARTIC to ON and Check Light	S																		
74. Check Filter Hose and Connectors	S																	X	
75. Check Intercom Connector	S																		
76. Check Heater Lamp Light	S																	X	
77. Adjust Heater Temperature	S																		
XIV. OPERATE PERSONNEL HEATER	DFRNT	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	?	?	NO	YES	NO
78. Turn Personnel Heater ON/OFF	D																	X	

XM1 TASK LIST (DRIVER)	MOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	HARDER	PROBLEM TRAIN	ASSIGN	CAUSE MOTOR	MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRANS	UNIT
79. Adjust Personnel Heat Output	S																	X	
80. Direct Personnel Heat Flow to Crew Compartments	S																	X	
81. Adjust Personnel Heater Airflow in Driver Station	S																	X	
XV. OPERATE PERISCOPE/VIEWER/IR LENSES	DFRNT	NO	NO	YES	NO	YES	NO	NO	NO	YES	YES	NO	NO	YES	1	X	YES	YES	NO
82. Remove/Install DR's Day (Middle) Periscope	S			X		X				X	X						X	X	
83. Unstow/Stow DR/LDR's Night Vision Viewer	D																X	X	
84. Unstow/Stow Day Periscope	D																X	X	
85. Install/Remove DR/LDR's Night Vision Viewer	D			X		X				X	X						X	X	
86. Operate DR/LDR's Night Vision Viewer	D			X			X			X	X			X	1	X	X	X	NO
a. Using Tank Power	(d)			(x)			(x)			(x)	(x)						(x)		
b. Using Battery Power	(d)			(x)			(x)			(x)	(x)						(x)		
87. Remove/Install/Stow Infrared Lenses	S																X	X	
XVI. PERFORM PRE-FIRE PMCS	UNIQUE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	?	?	NO	YES	NO
(NONE)																			
XVII. TARGET ACQUISITION	DFRNT	NO	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES	NO	?	?	NO	NO	NO
88. Acquire Targets From Closed Hatch	S			X			X			X	X		X						
89. Acquire Targets Using DR/LDR's Night Vision Viewer	D			X	?	X	X	?	?	X	X		X						

	NTI TASK LIST (DRIVER)	GOAL TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
		CRITICAL-ITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
90.	Acquire Targets From Open Hatch Using Naked Eye	S			X			X			X	X		X						
91.	Acquire Targets While Stationary	S			X			X			X	X		X						
92.	Acquire Targets While Moving	S/U		U	X	?	X	X	?	?	X	X		X						
93.	Hand-Off Acquired Targets	S/U		U	X		X	X			X	X		X						
XVIII.	TARGET ENGAGEMENTS (NORMAL)	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	YES	YES	1	X	YES	YES	NO
94.	Perform Prepare To Fire Checks (Stationary)	D			X			X			X	X	X	X	X	1	X	X	X	
	a. Clean Periscope	(s)																		
	b. Lower Seat/Close Hatch	(d)																		
	c. Turn Motor Power On	(d)																		
	d. Start Engine	(d)			(x)			(x)			(x)	(x)		(x)						
95.	Perform Prepare-To-Fire Checks (Moving) (Establish/Maintain Steady Speed)	S/U		U	X		X	X	?		X	X		X	X	1	X			
	Stationary Engagements																			
96.	Locate Announced Target	S			X			X			X	X		X						
97.	Search For Additional Targets	S			X			X			X	X		X						
98.	Search For Hull/Turret Reticle Positions	S			X			X			X	X		X						
99.	Round Sense	S			X			X			X	X	X	X						
100.	Maintain Tank Readiness	S	X																	
101.	Monitor DR Controls/ Displays	D		X	X			X	?		X	X		X						

XM1 TASK LIST (DRIVER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	DOMAIN-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
102. Monitor Fire Command	S			X			X			X	X		X						
103. Plan Route of Departure	S			X			X			X	X		X						
Moving Engagements:																			
104. Steer Tank Toward Target	S/U		U	X		X	X	?		X	X		X						
105. Maintain Steady Speed	S/U		U	X		X	X	?		X	X		X						
106. Avoid Area of Obstacles	S/U		U	X		X	X	?		X	X		X						
107. Search For Other Targets	S/U		U	X		X	X	?		X	X		X						
108. Search For Hull/Turret Defilade Positions	S/U		U	X		X	X	?		X	X		X						
109. Round Sense	S/U		U	X		X	X	?		X	X		X						
110. Respond to TC Driving Commands	S/U		U	X		X	X	?		X	X		X						
XIX. TARGET ENGAGEMENTS (EMERGENCY OR MANUAL)	DFRNT	NO	YES	YES	NO	YES	NO	POS	NO	YES	YES	NO	YES	?	?	?	?	?	NO
Moving Engagement:																			
111. Bring Tank to Steady Halt	S/U		U	X		X		?		X	X		X						
112. Prepare Tank to Move-Out From Brief Halt	D	X																	
XX. TARGET ENGAGEMENTS (USING SMOKE)	UNIQUE	NO	NO	YES	NO	NO	YES	POS	NO	YES	YES	NO	YES	?	?	?	?	?	NO
113. Operate Smoke Generator	U																		
114. Drive In Smoke Environment	U			X		X	X	?		X	X		X						
XXI. PERFORM DURING-FIRE PMCS (NONE)	UNIQUE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	1	Z	NO	?	YES
XXII. PERFORM POST-FIRE PMCS (NONE)	UNIQUE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	1	X	YES	?	NO

XM1 TASK LIST (DRIVER)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
XXIII. SHUT DOWN SYSTEM	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	YES	YES	1	X	YES	YES	NO
115. Shut Down (Stop) Engine	D		X	X			X			X	X	X	X	X	1	X	X		
116. Power Down and Secure Driver Station	D		X	X		X	X			X	X	X	X	X	1	X	X	X	
a. Power Down Hull Electrical System	(d)		(x)	(x)			(x)			(x)	(x)	(x)	(x)				(x)	(x)	
b. Close/Lock DR's Hatch	(d)		(x)	(x)		(x)				(x)	(x)		(x)				(x)	(x)	
c. Exit DR's Station	(d)																(x)	(x)	
XXIV. PERFORM DURING OPERATION PMCS (REPEAT TASKS #1, 2, 7)	DFRNT	NO	YES	YES	NO	YES	YES	POS	NO	YES	YES	YES	NO	YES	1	X	YES	NO	NO
117. Check Roadwheel and Compensating Idler Hubs and Arms	D																X		
118. Check Shock Absorbers	D	X						?									X		
119. Check Roadwheels and Compensating Idler Wheels	D																X		
120. Check Torsion Bars	D																X		
121. Check Track Assembly	D																X		
122. Check Support Roller Assembly	D							?									X		
123. Check Hub and Sprocket Assembly	D																X		
124. Check Driver Controls and Instruments	D																X		
a. Check Steer-Throttle Control for Freedom of Movement	(u)																(x)		
b. Check Steer-Throttle Control Adjustments	(u)																(x)		

NSI TASK LIST (DRIVER)	TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CRITICALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
c. Check Service Brakes for Pulling	(d)																(x)		
d. Check Parking Brake	(d)																(x)		
XXV. TROUBLESHOOT HULL	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	NO	YES	YES	1	X	YES	?	NO
125. Troubleshoot Driver Control Panel Warning and Caution Lights (22)	D		X	X	?		X	?		X	X		Y	X	1	X	X		
a. Master Warning/ Caution Light Failures (2 each)	(d)			(x)			(x)			(x)			(x)				(x)		
b. Engine Oil Lights (3)	(s)			(x)			(x)			(x)			(x)				(x)		
c. Transmission Oil Lights (3)	(s)			(x)			(x)			(x)			(x)				(x)		
d. Hydraulics System Malfunction Light	(u)			(x)			(x)			(x)			(x)				(x)		
e. Parking/Service Brakes Light (3)	(d)			(x)			(x)			(x)			(x)				(x)		
f. Circuit Breaker Lights (2)	(u)			(x)			(x)			(x)	(x)		(x)				(x)		
g. Cable Disconnected Light (1)	(u)			(x)			(x)			(x)	(x)		(x)				(x)		
h. Low Battery (2)	(d)			(x)			(x)			(x)			(x)				(x)		
i. Rear Fuel Pump (2)	(d)			(x)			(x)			(x)			(x)				(x)		
j. Fuel Control Faulty Light	(d)			(x)			(x)			(x)			(x)				(x)		
k. Air Cleaner Clogged Filter Light (1)	(u)			(x)			(x)			(x)			(x)				(x)		
126. Troubleshoot Driver's Indicator Lights (2)	D			X			X	?		X			X						
a. Engine Started Light	(d)			(x)			(x)			(x)			(x)						
b. Switch Indicator Light	(u)			(x)			(x)			(x)			(x)						

XM1 TASK LIST (DRIVER)	MOAI TASK COMPARISON ANALYSIS							TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	CRITICALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTIVATIONAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
127. Troubleshoot Engine (10)	D		X	X	?		X	?	?	X		X	X	1		X	X	
a. Fails to Crank	(d)			(x)			(x)			(x)		(x)				(x)		
b. Cranks but Fails to Start	(d)			(x)			(x)			(x)		(x)				(x)		
c. Cranks but Aborts	(d)			(x)			(x)			(x)		(x)				(x)		
d. Starter Fails to Engage	(d)			(x)			(x)			(x)		(x)				(x)		
e. Faulty Engine Speed at PVT	(d)			(x)			(x)			(x)		(x)				(x)		
f. Engine Smokes	(d)			(x)			(x)			(x)		(x)				(x)		
g. Engine Sluggish	(d)			(x)			(x)			(x)		(x)				(x)		
h. Engine Shuts Down Auto	(d)			(x)			(x)			(x)		(x)				(x)		
i. Engine Fails to Shut Down	(d)			(x)			(x)			(x)		(x)				(x)		
j. Fuel Pump Failure	(d)			(x)			(x)			(x)		(x)				(x)		
128. Troubleshoot Transmission (4)	D		X	X	?		X	?	?	X		X	X	1		X	X	
a. Fails to Shift Gears	(d)			(x)			(x)			(x)		(x)				(x)		
b. Tank Fails to Move	(d)			(x)			(x)			(x)		(x)				(x)		
c. Tank Fails to Turn	(d)			(x)			(x)			(x)		(x)				(x)		
d. Tank Fails to Pivot	(d)			(x)			(x)			(x)		(x)				(x)		
129. Troubleshoot Brakes (2)	D		X	X				?		X		X				X		
a. Service Brakes Faulty	(d)			(x)						(x)		(x)				(x)		
b. Parking Brake Faulty	(d)			(x)						(x)		(x)				(x)		

XM1 TASK LIST (DRIVER)	MOAI TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
130. Troubleshoot Driving Lights and Dome Lights (6)	D		X	X				?		X	X		X						
a. Domelight Fails to Light	(d)																		
b. Service Lights Fail to Light	(s)			(x)						(x)	(x)								
c. Hi-Beam Light Fails to Light	(s)			(x)			(x)			(x)	(x)								
d. BO-Lights Fail to Light	(s)			(x)			(x)			(x)			(x)						
e. Stoplights Fail to Light	(s)			(x)			(x)			(x)	(x)		(x)						
f. Turret Domelight Fails to Light	(s)																		
131. Troubleshoot Auxiliary Systems (10)	D		X	X			X	?		X	X		X				X		
a. Smoke Generator Failure	(u)			(x)			(x)			(x)			(x)						
b. Driver Gas Particulate Heater Fails to Heat	(s)			(x)			(x)			(x)			(x)	(x)	1	(x)	(x)		
c. Gas Particulate Filter Blower Failure	(s)			(x)			(x)			(x)			(x)	(x)	1	(x)	(x)		
d. Bilge Pump (2)	(s)			(x)			(x)			(x)			(x)						
e. Night Vision Viewer (AN/VVS-2) (2)	(u)			(x)			(x)			(x)	(x)		(x)	(x)	1	(x)	(x)		
f. Personnel Heater (3)	(s)			(x)			(x)			(x)			(x)	(x)	1	(x)	(x)		
XXVI. PERFORM AFTER OPERATION PMCS (REPEAT TASKS #1, 2, 4, 5, 6, 8, 115 thru 124)	DPRNT	NO	YES	YES	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	1	X	YES	YES	NO

XM1 TASK LIST (DRIVER)		TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING			TRAINING DELIVERY DATA					
		CRITICALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM DIAGN	PROBLEM ASSESS	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV	DTD TASK	SKILL LEVEL	TRNG TYPE	TRAINING SITE OSUT	TRAINING SITE TRANS	TRAINING SITE UNIT
132.	Check Skirt Panels, Fenders, and Mud Guards	U			X		X	X			X	X						X	X	
133.	Check Adjusting Link Assembly	D																X	X	
134.	Check Final Drive Plugs and Housing	D																	X	
135.	Check/Service Air Filter	U			X			X			X	X							X	
XXVII.	LUBRICATE XM1 ACCORDING TO LUBRICATION ORDER (LO)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO	YES	1	Z	NO	NO	YES

TABLE V

XM1 TASK LIST

(CREW INTERACTIVE)

XM1 TASK LIST (CREW INTERACTIVE)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING		
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV
I. PERFORM BEFORE/DURING/ AFTER PMCS (EXTERIOR)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	NO
1. Remove/Install Tank Tarpaulin	S												
2. Check/Service Basic Issue Items	D		X	X			X			X	X	X	
3. Refuel Tank	D		X	X			X			X	X		
4. Check Service Tank Driving Lights	S												
5. Check/Service Bore Evacuator	S			X		X				X	X		
6. Wash/Clean Tank	S												
7. Spot Paint Tank	S												
II. PERFORM BEFORE/DURING/ AFTER PMCS (INTERIOR)	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	YES	YES
8. Conduct NBC Check	S			X			X			X	X		
9. Conduct Radio Check	S			X			X			X	X		
10. Test Firing Circuits	D			X			X			X	X		X
11. Test Panel Lights	U												
12. Stow and Inspect Ammo	D												
13. Check/Service Main Gun Breechblock Assembly	S			X		X				X	X		

XM1 TASK LIST (CREW-INTERACTIVE)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING		
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV
III. BORESIGHT FIRE CONTROL SYSTEM	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	NO
14. Boresight Main Gun	D		X	X	?		X	?	?	X	X	X	
15. Boresight Cal .50	D		X	X			X			X	X	X	
IV. ZERO FIRE CONTROL SYSTEM	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	NO	YES
16. Zero Main Gun	D		X	X	?		X	?	?	X	X		X
17. Zero M240 Coax Machine-gun	D		X	X	?		X		?	X	X		X
18. Zero Cal .50 Machinegun	S												
V. ACQUIRE TARGETS	DFRNT	NO	NO	YES	NO	YES	YES	NO	NO	YES	YES	NO	YES
19. Perform Surveillance Duties	D	X											
20. Perform Silent Watch Duties	D	X											
21. Hand-[illegible] Acquired Targets	S			X		X	X			X	X		X
22. Obtain/Relinquish Turret Control	D			X		X				X	X		X
VI. ENGAGE TARGETS	DFRNT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES
23. Engage Targets With Main Gun	D/U	D	U	X	?	X	X	?	?	X	X		X
24. Engage Targets With Coaxial Machinegun	D/U	D	U	X		X	X			X	X		X

XM1 TASK LIST (CREW INTERACTIVE)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING		
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV
25. Engage Targets With Cal .50 Machinegun	D/U		U	X	?	X			?	X	X		X
26. Engage Targets With Leader's M240 Machine-gun	U			X		X	X			X	X		X
27. Engage Targets Using Range Card Data	D	X		X			X			X	X		X
28. Engage/Evade Targets Using Smoke	U			X		X	X			X	X		X
VII. ADJUST FIRE	DFRNT	YES	YES	YES	POS	YES	YES	POS	POS	YES	YES	NO	YES
29. Round Sense	D/U	D/U	U	X	?		X	?	?	X	X		X
30. Turret-Carry	D/U	D	U	X		X	X			X	X		X
31. Toggle Range Correction	U			X	?	X	X	?	?	X	X		X
VIII. RESPOND TO FIRE CONTROL SYSTEM FAILURES	DFRNT	NO	YES	YES	POS	NO	YES	POS	POS	YES	YES	YES	YES
32. Respond to Main Gun Misfire	S			X			X			X	X		X
33. Respond to Coax Machine-gun Misfire	S			X			X			X	X		X
34. Respond to LRFD Multiple Returns	U			X	?		X	?	?	X	X	X	X
35. Respond to Combined Weapon System Failures	U			X	?		X	?	?	X	X	X	X

XM1 TASK LIST (CREW INTERACTIVE)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING		
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV
IX. RECOVER A TANK	DFRNT	NO	YES	YES	NO	YES	YES	NO	NO	YES	YES	NO	NO
36. Slave Start A Tank	D			X		X	X			X	X		
37. Tow Start A Tank	D			X		X	X			X	X		
38. Tow A Disabled Tank	D		X	X		X	X			X	X		
39. Retrieve A Mired XM1 Tank by Similar Vehicle	D			X		X	X			X	X		
40. Short Track A Tank	U			X		X	X			X	X		
41. Remove/Install A Thrown Track	D			X		X	X			X	X		
42. Remove/Install Track Blocks	D			X		X	X			X	X		
43. Unlock Stuck Parking Brakes	U			X		X	X			X	X		
X. FORD WATER OBSTACLE	DFRNT	NO	YES	YES	NO	NO	YES	POS	NO	YES	YES	YES	NO
44. Install Water Fording Kit Items	D		X	X			X	?		X	X	X	
45. Inspect Fording Vehicle	D		X	X			X			X	X	X	
46. Prepare For Operation After Fording	D		X	X		X	X			X	X	X	
XI. PERFORM TANK/CREW SURVIVAL ACTIONS	DFRNT	YES	YES	YES	NO	YES	YES	POS	NO	YES	YES	YES	YES
47. Respond To Nuclear Attack	D			X			X			X	X	X	

XM1 TASK LIST (CREW INTERACTIVE)	M60A1 TASK COMPARISON ANALYSIS								TENTATIVE SOLUTION		TRAINING		
	COMMON-ALITY	TASK PERFORM EASIER	TASK PERFORM HARDER	PROBLEM TRAIN	PROBLEM ASSIGN	CAUSE MOTOR	CAUSE MENTAL	JOB SAMPLE	SELECT	TRAIN	MORE HO	JOB AID	TRNG DEV
48. Respond To Chemical Attack	D			X			X			X	X	X	
49. Evade Missile Attack	D	X		X		X	X			X	X		X
50. Redistribute Main Gun Ammo	D		X	X		X	X			X	X		
51. Extinguish A Tank Fire	D	X		X			X			X		X	
52. Remove Injured Driver Through Driver's Hatch	D		X	X		X	X			X	X		
53. Remove Injured Crew Member Through Loader's Hatch	S			X		X		X		X	X		
54. Camouflage Tank	S			X			X			X	X		
55. Decontaminate Tank	S			X			X			X	X	X	
56. Escape From A Tank	D		X	X		X	X			X	X		
57. Operate Radiological Warning Device (RADIAC) AN/VDR-1													
58. Operate Decontaminating Apparatus, ABC-M11													
59. Operate Detector Kit, Chemical Agent, M256													
XII. MAINTAIN VEHICLE/EQUIPMENT	S	NO	NO	X	NO	X	X	NO		X	X	X	
60. Perform PM on BII	S			X		X	X			X	X	X	
61. Prepare Power Pack for Removal	S			X		X	X			X	X	X	